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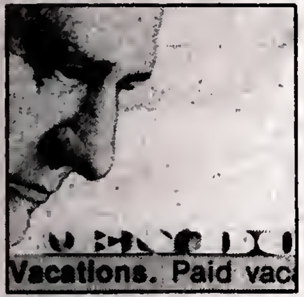

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Piracy case settled

Defendants admit to unauthorized copying, agree to reimburse vendor

By Peter Bartolik
CW Staff

ARLINGTON, Va. — The Association of Data Processing Service Organizations, Inc. announced here last week an out-of-court cash settlement in which American Brands, Inc. and its subsidiary admitted to unauthorized software duplication by the subsidiary.

A lawsuit filed earlier this year by Adapso, in conjunction with Micropro International Corp. [CW, Jan. 21], alleged that the Chicago-based subsidiary, Wilson Jones Co., had engaged in the unauthorized reproduction and distribution of three Micropro products — Wordstar, Mailmerge and Spellstar.

A joint statement agreed to by the parties in the litigation announced that "some software products have in the past been improperly duplicated by some [Wilson Jones] personnel, although such duplication was without the knowledge or acquiescence of [American Brands] or its executives."

See **SETTLE** page 10

NCR user wins $5.8 million suit

By Jeffry Beeler
CW West Coast Bureau

SAN LUIS OBISPO, Calif. — A Superior Court jury here has awarded $5.8 million to a Southern California businessman after finding that NCR Corp. had misrepresented the capabilities of a system the vendor sold him in 1977.

The award stems from a six-year lawsuit in which Alex Madonna accused NCR of selling him a system that lacked the appropriate mass storage to meet his construction company's information processing needs.

NCR's attorney, Robert Wendt, accused the jury of "allowing NCR's wealth to bias its verdict" and promised to file a posttrial motion for reversal of the court's decision. If the motion is rejected, the defendant will appeal, he said.

The award is the largest granted in a misrepresentation case involving a computer vendor, exceeding the $2.6 million NCR paid a California dry-cleaner [CW, Nov. 1, 1982] after being found guilty of willful fraud and misrepresentation.

See **MADONNA** page 12

Ramis II enhanced for production applications

By John Desmond
CW Staff

WASHINGTON, D.C. — In a series of product announcements here, Martin Marietta Data Systems last week enhanced the performance of its Ramis II fourth-generation language in production applications. It also extended the product's reporting capabilities to users of AT&T's Unix System V and IBM Personal Computers.

Martin Marietta also announced products intended to merge Ramis II with the UFO applications development system originated by Oxford Software Corp., which Martin Marietta acquired in January.

The company announced the following:

- A System Building Executive component for Ramis II. A successor to the Ramis II Executive, SBX was designed to meet the performance requirements of major production applications while maintaining the nonprocedural programming aspects of Ramis II. SBX offers 10 times the performance of the Ramis II Executive, a spokesman said. SBX is a compiled system, said to generate more compact code than Ramis II, which is interpretive.
- An optional intelligent editor component of SBX, dubbed Smartedit. Smartedit is for use in development and maintenance environments to improve productivity for applications developers and experienced end users. With the editor, Ramis II users can develop, modify, test and store Ramis II requests and SBX procedures within the Ramis II environment.
- A Cobol-based applications development software product, designated Cobol/Extended Environment. Cobol/XE is an Ansi Cobol-based CICS applications development system that currently supports Cobol programming in IBM DOS and OS/CICS environments. Support in more operating environments is planned. Cobol/XE, the successor to UFO/Cobol, is said to improve efficiency of programmers writing on-line

See **RAMIS** page 6

TOP OF THE NEWS

To appeal or not to appeal? That was the question for MCI in the wake of a jury's $38 million award to the company in its antitrust suit against AT&T. **Page 2.**

■

Uncertain tariffs and a desire to gain network control were among the reasons cited by some users for trading in private-line networks. **Page 4.**

■

Mounting a challenge. AT&T has high hopes for taking on IBM in Big Blue's backyard, but users and analysts aren't as optimistic. **Page 8.**

■

Kodak unwrapped an AT&T Unix-based electronic publishing system said to automate all aspects of in-office publishing. **Page 10.**

■

Diamond in the rough. Digital Research's Gem Draw graphics package is being warmly received by early users, who praise its Apple Macintosh-like traits. **Page 37.**

FYI

Users key in on-line debugging

By Charles Babcock
CW New York Bureau

NEW YORK — As the complexity of software packages grows, so does the reliance on hot-line troubleshooting. But effective use of hot lines requires well-informed, well-prepared users as well as vendor expertise, according to hot-line managers.

To help handle the growing volume of calls, some software vendors are putting their troubleshooting services on-line, creating data banks of previously solved problems.

At Management Science America, Inc. in Atlanta, where calls come in at a rate of 400 to 500 a day, hot-line troubleshooters do keyword searches for cases similar to the one a caller is describing, said Kenneth M. Schultz, manager of client services.

Cullinet Software, Inc. enters each of its calls into an on-line tracking system, which can also be used for keyword searches of previously described problems, said Gary L. Wright, director of corporate technology support for the Westwood, Mass.-based firm.

Martin Marietta Data Systems in Princeton, N.J., is scrutinizing the on-line tracking system at the offices of former Oxford Software Corp., a recent acquisition. Martin Marietta would like to implement a similar system for its 130 calls a day, said Sue Goldberg, manager of technical assistance for Martin Marietta's Ramis II.

There remains, however, no substitute for close, two-way communication, sometimes a difficult thing to achieve over the telephone, according to the hot-line managers.

See **PROBLEMS** page 14

NEWSPAPER

MCI wins $38 million, may appeal

By Bryan Wilkins
CW Washington Bureau

CHICAGO — Although dissatisfied with the $37.8 million in damages awarded it by a jury last week, MCI Communications Corp. is undecided on whether to appeal the award in the retrial of its antitrust suit against AT&T.

Immediately following the verdict last Tuesday, MCI Chairman and Chief Executive Officer William McGowan said his company would appeal. But less than 24 hours later, McGowan was reconsidering that position, hinting that MCI would not want to jeopardize a separate but similar suit against AT&T that will go to trial within a year.

McGowan labeled the $37.8 million award, to be tripled under federal antitrust law to $113 million, insufficient to compensate for damages he claimed MCI had suffered. McGowan said the presiding judge had not instructed the jury sufficiently that the proof of six charges of AT&T's antitrust behavior had already been established in a lower court case — a finding upheld by an appeals court.

> ”
>
> *'We expected a lot more, we anticipated a lot more and the outcome was certainly not what we expected.'*
>
> **— Bert Roberts**
> **MCI Telecommunications Corp.**

In the trial that concluded last week, MCI argued unsuccessfully that it had suffered $5.8 billion in damages, including lost profits from postponing its Execunet business service.

AT&T said it had not decided whether it would appeal but indicated general satisfaction with the outcome. "We are pleased that the jury successfully grappled with the complex issues before it and was able to render a verdict in line with the evidence," the company said in a prepared statement.

The $113.3 million in trebled damages awarded MCI last week is far less than the $1.8 billion in damages, after trebling, awarded in 1980 when the case first was tried. MCI charged AT&T denied it the local connections needed to complete its calls. The charge was upheld by the jury in 1980, but the damages were remanded by a federal judge to the lower court for reconsideration.

AT&T now is liable to MCI for 31.5% of any damages amount, while six regional holding companies are responsible for the remaining amount. The seventh regional holding company, U.S. West, independently settled out of court with MCI for some $63 million in cash and other considerations, anticipating a higher award from the court in the retrial.

During the trial, presiding U.S. District Judge John F. Grady questioned the tactics of MCI in calculating the total "lost profits" it suffered. MCI did not break out the various components of residential and business service that were affected for the jury to make its own determination of what damages it had suffered.

AT&T argued that, at most, the damages incurred by MCI could not have exceeded $34 million, a figure the jury appeared to have followed.

The trial on the damages amount covers the period prior to 1975. MCI has filed a second antitrust suit in Washington, D.C., against AT&T alleging similar antitrust behavior for the period after 1975. That suit is scheduled to come to trial sometime next year.

Bert Roberts, president of MCI Telecommunications Corp., MCI's long-distance communications subsidiary, and a key witness in the trial, told *Computerworld* that while the company was surprised at the outcome of the jury's decision, it had not made any strategic plans in anticipation of a larger award.

"We've never run this company on anticipation that a jury would award us a large amount of money," Roberts said. "Obviously, we had asked for a lot more than we got. Based on our judgment, we expected a lot more, we anticipated a lot more and the outcome was certainly not what we expected.

"However, there was one clear issue to come out of the trial," Roberts added. "There was the jury's decision that none of the damages in this trial were related to Execunet [MCI's business service]. Those damages will be tried in the second antitrust trial, and you're going to see some big numbers talked about," Roberts said.

A spokesman for U.S. West, the regional holding company that had previously settled with MCI, said the company was "not at all unhappy" with its out-of-court settlement with MCI. He noted that the settlement also relieves the company of any potential liability that the other six Bell holding companies and AT&T may face as a result of the second round of antitrust charges still to be tried for the period from 1975 to the present.

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Random access

Production of Intel's 32-bit 80386 microprocessor is on schedule, with customer samples of the 300,000-transistor chip expected in the second half of 1985, according to Dave House, vice-president and general manager of Intel's Microcomputer Group. Another upcoming and not yet officially announced product is the 82786 graphics coprocessor, which will handle windowing and other display functions in hardware and will be sampled next year. Meanwhile, the follow-on 80486 chip, "still in the definition stage," will provide an on-board floating-point processor, a large cache memory and other advances that will further boost performance, House said.

■

The Institute for Certification of Computer Professionals (ICCP) is expected to announce guidelines for the recertification of professionals currently holding the ICCP's Certified Systems Professional (CSP), Certificate in Data Processing (CDP) and Certificate in Computer Programming (CCP) documents. The requirements for periodic recertification of the CSP holders is expected to begin early in 1986, and the recertification cycle for applicants taking the CDP and CCP exams will start with the May 1986 applicants, an ICCP spokesman said. Holders of CDP and CCP certificates received before or during 1985 will not have a mandatory recertification requirement, the spokesman said.

■

Xerox is scheduled to unveil a 60 page/min nonimpact printer using ion deposition technology sometime in August, according to industry sources. The device will mark Xerox's initial foray into a technology alternative to laser printing, a market in which the company is an acknowledged leader. The printer will be powered by a Delphax Systems, Inc. 2460 ion deposition printer engine. Xerox recently acquired a 50% interest in Delphax, a Westwood, Mass., company that holds the patents on ion printing technology. Though it has yet to make a dent in laser printer sales, ion deposition has been touted as a more reliable, less expensive technology than laser printing.

■

An intelligent I/O processor that allows creation of backup tapes without tying up the CPU is being produced by Intelligent Storage, Inc., a $13 million start-up company in Longmont, Colo. Compatible with IBM's major operating and disk systems, the processor transfers data from disk to tape, using a host processor channel only when commands or status are being transferred, spokesmen said. Representatives of Memorex, which already markets an Intelligent Storage tape cache processor, said they are considering marketing the device.

■

What was it that made MCI Communications Chairman Bill McGowan flip-flop on the issue of whether to appeal the $38-million damages verdict awarded MCI in its antitrust suit against AT&T? According to an MCI spokesman, the resourceful McGowan may just be using the press to "test the waters" to see if an appeal would be viable, adding, McGowan is "unpredictable."

■

McDonnell Douglas Corp. is putting the finishing touches on a new telephone system. The St. Louis-based company is replacing its AT&T private branch exchanges with Northern Telecom's SL-100 switches sold by Contel Information Systems. The system will link approximately 30,000 McDonnell Douglas employees located in offices throughout the U.S. onto a private network that will handle all intracompany calls. Calls outside of the company will go through Southwestern Bell Corp. for local service or AT&T for long-distance calls.

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Switch to satellite net satisfies users' need for control

FIRST USER

By Paul Korzeniowski
CW Staff

Uncertain tariffs, problems stemming from working with a multitude of telephone companies and a desire to control their networks are the principal reasons why the first users of M/A Com, Inc.'s Integrated Satellite Business Network are trading in their private-line networks.

Wal-Mart Stores, Inc., based in Bentonville, Ark., and Southland Corp., located in Dallas, started looking for an alternative to their networks a year and a half ago. "When Ku-band transmission became available, satellite transmission became a cost-effective alternative to terrestrial transmission," said Robert L. Martin, vice-president of information systems at Wal-Mart.

The department store chain plans to connect its 750 stores and warehouses located in 20 states with a private, $16 million digital satellite network. A 9-meter earth station has been installed at Wal-Mart's Bentonville facility. It will be used for voice transmission between company locations and data transmission to and from the company's IBM 3081, 3083 or 4381 mainframes.

Other 1.8- or 2.4-meter stations will be placed at each Wal-Mart distributor or store. "The larger [2.4-meter] earth stations will be positioned where weather may hinder transmission or where stores are located at the edge of a footprint," Martin said. A footprint is the range of a satellite transmission.

The distributors house IBM 3033 or 4300 series mainframes; each store has one or two IBM Series/1 minicomputers. "Each earth station provides a bandwidth of up to 128K bit/sec.," Martin noted. He estimated that 56K bit/sec. will be used for data transmission, and the remaining bandwidth will be divided into 16K bit/sec. digitized voice trunks for a virtual private network.

The vice-president did not think echo delays inherent in satellite transmission would cause any problems. "There have been advancements in echo cancellation techniques that alleviate the problem of voice delay," Martin said. "However, there is still a slight delay."

The central earth station has been constructed and has been certified by the Federal Communications Commission. M/A Com will supply the earth stations, but Wal-Mart has not chosen a vendor to provide the satellite capacity. "We have narrowed the choice to three vendors," Martin said. "We will choose one by next month."

When the vendor is chosen, Wal-Mart will add two warehouses to the system. Full-scale implementation of the system will begin during the summer. Beginning in the fall, 50 stores per month will be added to the system until 750 locations are on the system in the first quarter of 1987.

New system, new applications

The new communications system will supply Wal-Mart with new applications. "Currently, we poll our warehouses three times a day," Martin said. "With the satellite network, we will be able to poll them more often. At first, the system will be underused, but we will require a wider bandwidth as we design more interactive applications."

In contrast, Southland initially will limit its satellite network to data transmission. "We are replacing our 100-line multidrop network with a satellite network," said William McMinn, manager of voice and data communications at Southland.

Southland operates more than 7,500 7-Eleven stores throughout the U.S. and Canada. The chain is managed by approximately 300 district offices equipped with IBM System/36 minicomputers.

At the hub of the satellite network is a 9-meter central earth station located in Dallas. "We tested an M/A Com earth station in January 1984 just to see if the system could transmit data to our Winter Haven, Fla., office," McMinn said.

When the test was successful, the company decided to link, by a satellite system, its district offices' hardware with IBM 3081 and Amdahl Corp. 5860 mainframes in Dallas. The $6 million satellite network will be used for 16 on-line applications, and a million transactions will be processed each day.

Southland, like Wal-Mart, has built its central station, has had it certified by the FCC and is negotiating with satellite vendors. The company will start adding offices to the network during the summer and plans to have it fully operational by June 1986.

May transfer voice net to satellite

When the data system is completed, Southland may transfer its voice network to the satellite system. "We have to test the voice capability to see if our users would be happy with the slight delay that accompanies satellite voice transmission," McMinn noted. "If the delay is minimal, we may add voice capability for all our district offices' earth stations. In the long term, we may place some earth stations at our stores and tie them into the network."

Video transmission may also be added. "We may want to transmit speeches from the president of the company to our district offices," McMinn said.

Even without the voice and video capabilities, the manager estimated that the satellite system would pay for itself in five years.

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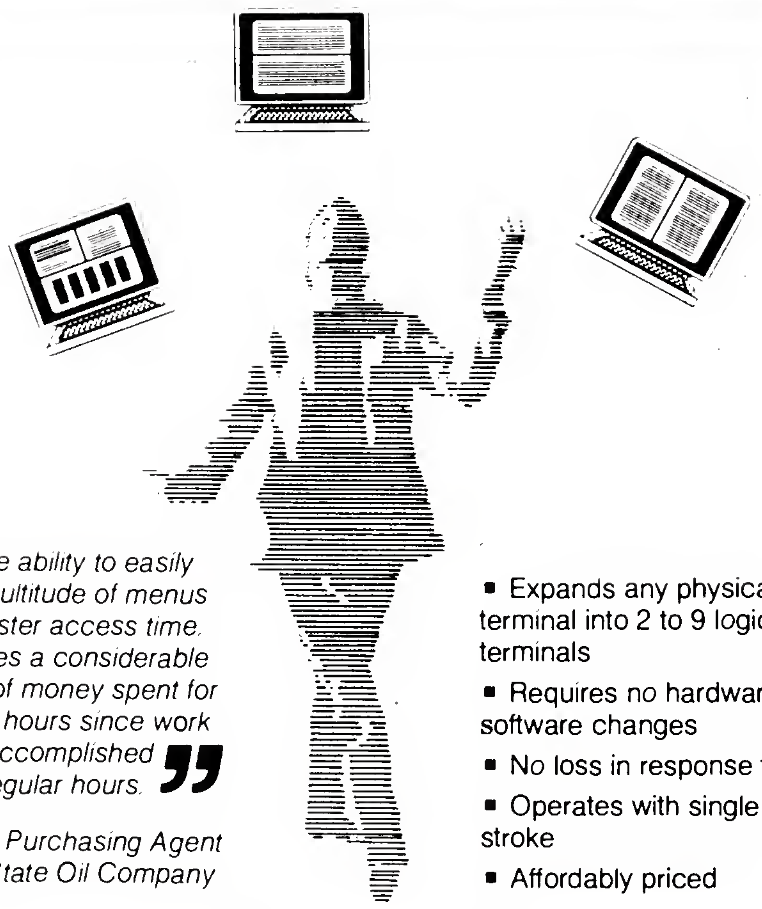

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Report to spot productivity

What do DP and MIS managers need to keep their staffs productive and their software running efficiently?

Computerworld's August Special Report will examine this year's productivity tools and trends. It will focus on the tried-and-true maintenance techniques and the new technologies that managers are blending to keep their organizations operating smoothly.

Contributions will be considered for publication until June 26. They should take one of two forms: a tutorial article, discussing an issue or trend, or an application story, outlining a particular user firm's experience with productivity tools.

Articles must be typed, double-spaced, and range in length from three to six pages. Artwork, such as charts, graphs and photographs, is encouraged. Authors should include a brief biography and a telephone number at which they can be reached.

If you have a story to tell or questions to ask, contact Janet Fiderio, Special Reports Editor, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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WHODUNIT

Sortland Yard warns against "Raffles-type sort programs."

Call (201) 568-9700.

Ask for Inspector SyncSort!

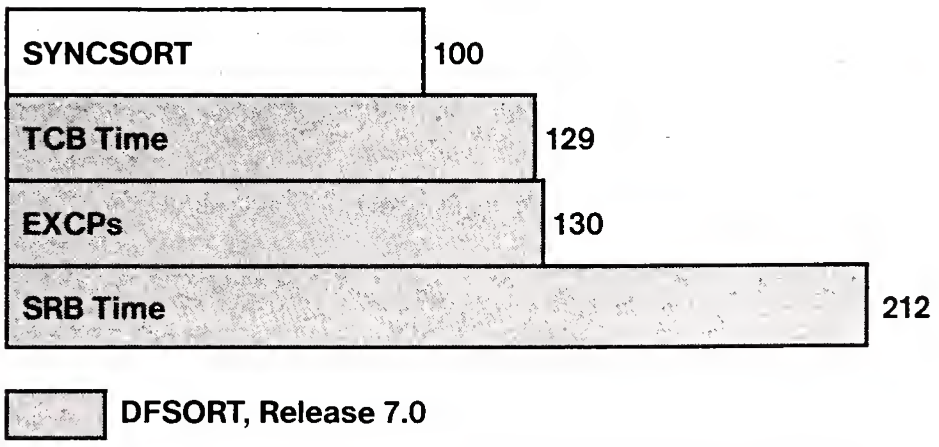
In an extraordinary move, Sortland Yard today warned data processors throughout the world to be on guard against what it termed "gentleman-bandit sort programs."

The warning was issued by one of the Yard's best known figures, Inspector SyncSort, who has sometimes been called "a legend in his own CPU time."

The inspector said, "One of the difficulties in apprehending these chaps is that they look so eminently respectable. They're members of a fine old hardware family. They've been to the right schools. And they invariably carry out their burglaries while wearing a dinner jacket from Saville Row."

EXPERT COMPUTER CRACKERS. "But once the party is underway," the inspector said, "these chaps head straight for the place where the family jewels are kept. They can crack open a computer and make off with a king's ransom in computer resources before you can say 'Hound of the Baskervilles.'"

To indicate "the true cost of this sort of misbehavior," the inspector released the following crime statistics:



SOMETIMES TAKE HOSTAGES. The inspector noted that these black-sheep programs often "take a dreadful toll" of programmers. "They are often tied up for days on end and forced to perform unnecessary coding, compiling and debugging. And they are heartlessly deprived of the labor-saving features that are taken for granted in most parts of the civilized sorting world."

Among these the inspector listed:

- **SORTWRITER**
- **MULTIPLE OUTPUT**
- **RECORD EDITING**
- **FAST FILE COPY**
- **MAXSORT**

TELEPHONE BEST DEFENSE. The inspector urged data processors to call the Yard immediately if they suspect their center is infested by a Raffles-type sort program. "The number is (201) 568-9700. We'll send over one of our highly trained sort detectives to track the culprit down."

Questioned as to what would be done with sort programs caught burglarizing computer centers, the inspector replied. "They will be given a just and speedy trial. If found guilty, they will immediately be transported to Iran!"

syncsort INC.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

Information Builders unveils VAX version of Focus

By John Gallant
CW Staff

NEW ORLEANS — Information Builders, Inc. last week introduced a Digital Equipment Corp. VAX/VMS version of Focus, its widely installed fourth-generation language.

Unveiled at the Dexpo '85 conference here, the VAX version of Focus makes the product available for mainframes, minicomputers and microcomputers. Focus also runs on IBM mainframes and Personal Computers. A spokesman said Focus applications and data are portable across those environments, and users can access and transfer data between computers using the Focus language.

The spokesman said the VAX version of Focus runs under DEC's VMS 4.0 operating system and is scheduled for general shipment in the fall. Focus for the VAX features the following: a report writer; data management and applications development tools; a screen manager; an editor; screen painter; the company's Talk facilities, Financial Modeling Language (FML) and Foccalc spreadsheet; and graphics and statistics capabilities.

The report writer allows reports and ad hoc information requests to be formulated using the Focus nonprocedural language, which features sort, calculation and formatting capabilities as well as on-line error correction and Help facilities. The report writer can process Focus data bases, any DEC RMS files or RDB data bases and other third-party files.

Focus' data management capabilities are based on a shared-relational data model, the spokesman said, with all transaction processing accomplished through English statements. For applications development, Focus allows users to write programs, design screens and perform validations and table look-ups through English statements.

The Fidel screen manager facilitates the development of data entry and display screens, and the editor and screen painter facility — dubbed Ted — was designed to accommodate development of I/O screens and transaction processing logic.

The Talk facilities include programs for data base creation — Filetalk; data modification — Automod; and reporting — Tabletalk. The FML was designed to handle the creation, calculation and presentation of financially oriented data. Foccalc is a 1,000- by 1,000-matrix electronic spreadsheet with facilities for automatic data import, spreadsheet population and consolidation and cross-machine model transfer.

Using the nonprocedural language, the graphics tools allow for the creation of connected point plots, histograms, bar and pie charts and scatter diagrams. Statistics facilities provide a set of functions and analyses, including cross-tabs, time-series and regression analysis.

The spokesman said the VAX version of Focus is priced on a sliding scale from the Microvax I to the VAX 8600 and Vaxclusters. The one-time license fee for the Microvax I is $6,000 and $52,000 for the VAX 8600. Monthly license prices start at $550 for the VAX-11/720.

Information Builders is located at 1250 Broadway, New York, N.Y. 10001.

RAMIS

from page 1

transaction processing applications.

- UFO/Ramis II Pathway, a further effort to integrate Ramis II with UFO. The product allows UFO users to generate reports from Vsam files maintained by UFO using Ramis II's fourth-generation syntax.
- Versions of the Ramis II report writers for IBM PC-DOS and Unix System V environments, dubbed PC/Reporter and Unix/Reporter. PC/Reporter allows personal computer users with any sequential or comma-delimited Ascii files to generate reports using Ramis II's syntax. The product runs on any IBM Personal Computer, Personal Computer XT or AT equipped with two floppy disks and at least 512K bytes of memory. Unix/Reporter allows generation of reports from Unix flat files running on any micro, supermini or mainframe.
- Enhancements to the Ramlink micro-mainframe link product, which so far has not been delivered in production quantities. The enhancements include support for Digital Consulting Associates, Inc.'s Irma and Forte Data Systems' Forte communications boards. The Ramlink enhancements are scheduled for availability this month as part of Ramis Release 85.2.

Martin Marietta also announced that an updated Data Base Manager (DBM) for Ramis II, which will allow for concurrent updating of the data base, is scheduled for fourth-quarter delivery. The company admitted that technical problems have pushed back delivery to that date.

SBX reportedly is a full-function programming language that provides structured programming facilities and supports screen- or line-oriented communications with terminal users. Marketing Vice-President Frank Fish said SBX was designed to improve the response time and reliability of interpretive languages such as Ramis II, which he said are not adequate for all users. Scheduled for availability this month, SBX will be provided for no charge as part of the Ramis II maintenance program. Migration to SBX from Ramis II Executive is not required, but migration aids are available.

Smartedit features include the use of templates to provide a structured outline of frequently used statements, full screen editing, a split screen, on-line Help and operation on procedures from Ramis II SBX libraries or on CMS and TSO system files. Scheduled for availability this month, Smartedit costs from $2,250 to $4,500.

Cobol/XE allows any Cobol programmer to write on-line programs under CICS or CMS as if they were batch programs. In addition to CICS/VS, Cobol/XE allows programmers to develop CICS applications under VM/CMS. With the product's screen painting facility, programmers can design screen layouts on a 3270 or Personal Computer XT/370 screen without writing code. Prices for Cobol/XE, which runs on IBM mainframes, are $15,000 for the VM/CMS version, $24,000 for the DOS/CICS version and $33,000 for the OS/CICS version. The product is available now.

UFO/Ramis II Pathway is a free component to users with both Ramis II and UFO. Deliveries of Pathway are scheduled for this month.

Ramis II Release 85.2 will also extend Ramlink support to CICS under DOS/VSE, CICS, MVS and Martin Marietta's Atlas under DOS/VSE. Ramlink also allows for bidirectional transfer of data from Ramis II data bases, Vsam and Isam files, Software AG's Adabas, Cincom Systems, Inc.'s Total, IBM's IMS and DL/1 data bases and Cullinet Software, Inc.'s IDMS.

Both PC/Reporter and Unix/Reporter are reportedly scheduled for third-quarter availability. On single-user machines, PC/Reporter costs $795, while the Unix/Reporter costs $995.

More information is available from Martin Marietta, P.O. Box 2392, Princeton, N.J. 08540.

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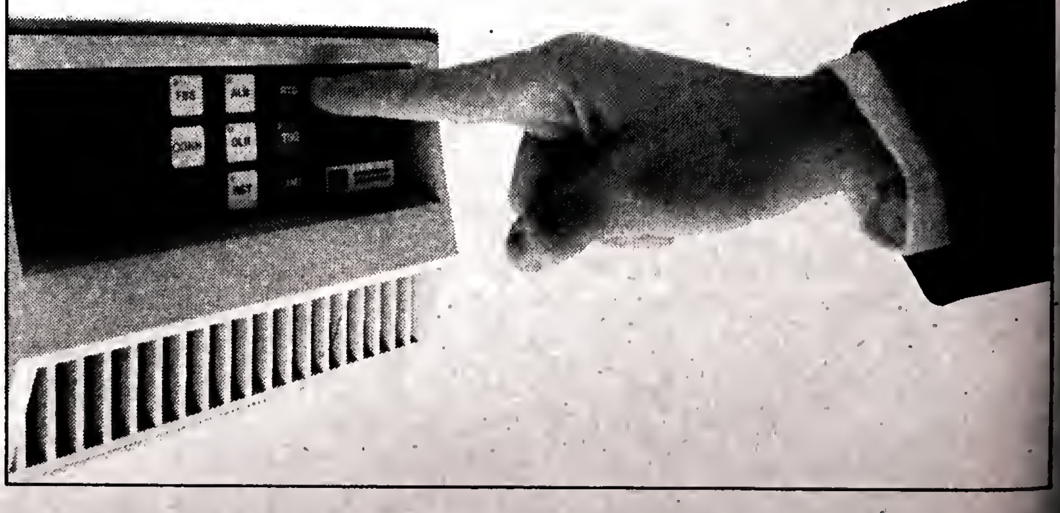

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Altos extends supermicro line with multiuser system

By Kathleen Sullivan
CW West Coast Bureau

SAN JOSE, Calif. — Altos Computer Systems, Inc. is slated to extend its lineup of supermicrocomputers today with the Altos 2086, a multiuser system based on Intel Corp.'s 80286 microprocessor.

The Altos 2086, which runs Microsoft Corp.'s Xenix 3.0 operating system, can support up to 20 users, the company said. The new system is said to be software compatible with the IBM Personal Computer AT. It also reportedly can read and write IBM Personal Computer AT diskettes and run most software written for the Personal Computer AT under Xenix.

The Altos 2086 is said to feature a modular, multiple-board design. In a 20-user configuration, the system includes a CPU board, a random-access memory (RAM) board, two file processor subsystem boards and two serial communications boards. Two additional board slots are available for expanding the system, the company said.

The Altos 2086's CPU board is said to include an 80286 microprocessor running at 8 MHz with no wait states. The CPU board contains 4K bytes of high-speed RAM cache memory. This cache memory can temporarily hold portions of main memory, allowing the microprocessor to gain faster access to data and instructions, the company said.

The Altos 2086's RAM board can accommodate up to 8M bytes of RAM, using 2M- or 4M-byte boards, according to the vendor.

At the center of the Altos 2086 is a two-board file processor subsystem. One board reportedly contains storage device controllers. A second board, which contains an Intel 8086 microprocessor running at 8 MHz, controls file access, managing four direct memory access channels.

In a standard configuration, the system includes a 1.2M-byte floppy disk drive, a 60M-byte streaming tape drive and a 63M-byte (formatted) hard disk drive. Users can expand the system by installing Altos' hard disk drive modules, which include power supplies.

The Altos 2086 can accommodate up to three hard disk drives for total storage of 189M bytes.

Each serial communications board for the Altos 2086 is said to include an Intel 8086 microprocessor running at 8 MHz. Each board has a total of 10 ports. Up to two ports can support synchronous protocols, while one port can be software selected to operate Altos' local-area network, known as Worknet, the company said.

The standard serial communications board is said to include 32K bytes of RAM. Altos is also offering a 128K-byte RAM board that will support X.25 or IBM's Systems Network Architecture (SNA) protocol software.

Each Altos 2086 will be shipped with user and field service diagnostics, the company said. The Altos 2086 is also said to feature remote diagnostics capability.

According to Altos, the system will support IBM 3270 and 3780 bisynchronous and 3270 SNA/Synchronous Data Link Control communication for mainframe communications.

In a 20-user configuration, which includes 2M bytes of RAM, a 63M-byte hard disk drive, a 1.2M-byte floppy disk drive, a 60M-byte tape drive and an Altos terminal with a monochrome display, the Altos 2086 will sell for $19,990.

More information is available from Altos, 2641 Orchard Pkwy., San Jose, Calif. 95134.

FCC to revise equal access

WASHINGTON, D.C. — The Federal Communications Commission last Friday was expected to revise its equal access implementation rules for the seven regional holding companies. The revisions would require the divested Bell operating companies to divide default long-distance traffic among all competitive long-distance carriers, not just route it to AT&T.

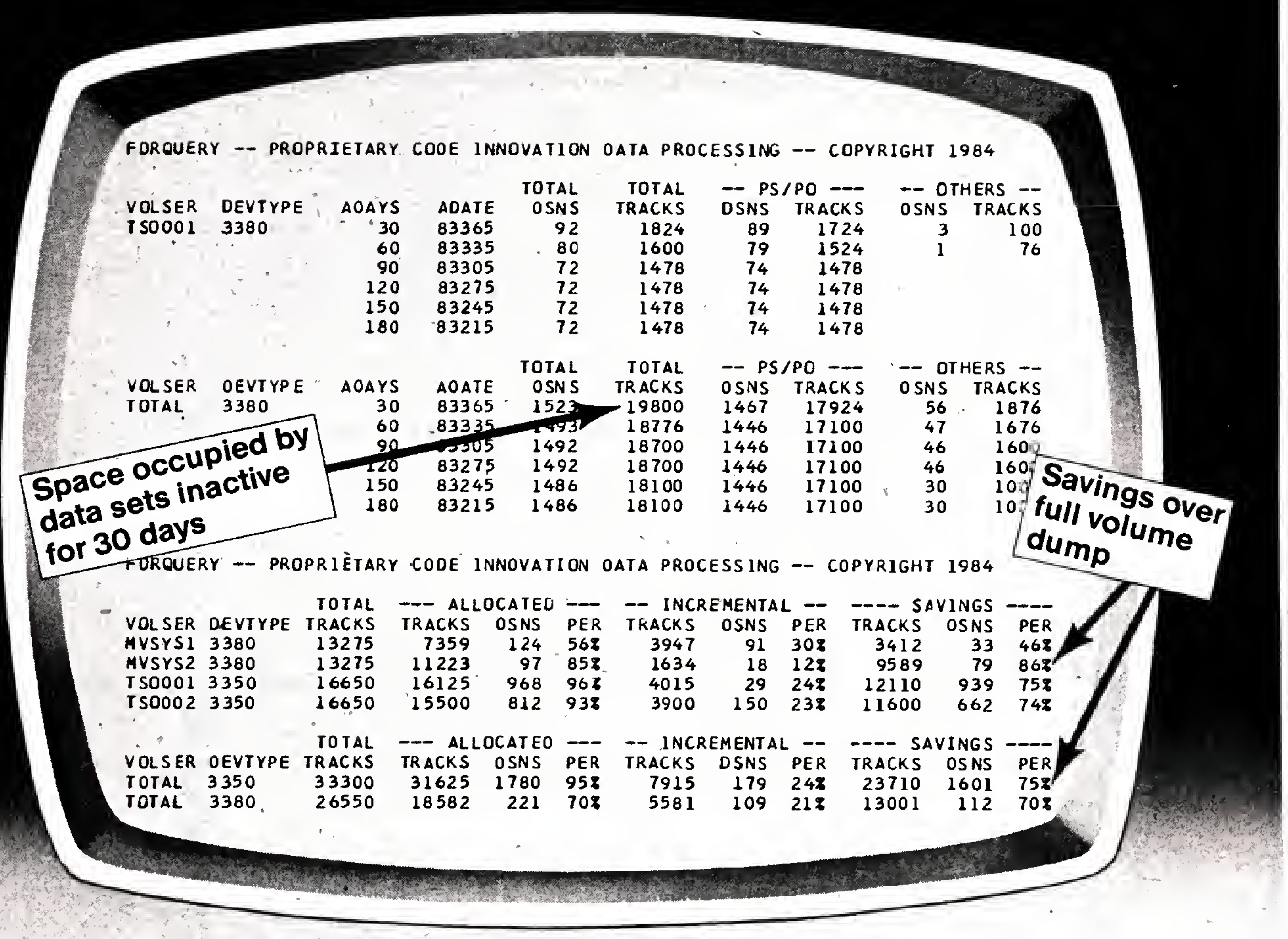
This plan, which has already been adopted by the companies that comprise U.S. West, one of the regional holding companies, has received the endorsement of the U.S. Department of Justice [CW, April 22].

The original terms of the AT&T divestiture and the FCC implementation guidelines required that default traffic be routed to AT&T from customers that have not yet selected a long-distance carrier in areas where equal access has already been implemented.

Under the U.S. West plan, customers are twice asked to fill out ballots for their carrier preference. If they do not select one, they are ultimately assigned to a carrier according to a percentage allocation formula that reflects the ballots filed in the phone exchange that is being converted to equal access.

The FCC last week was also expected to make other changes in the equal access implementation rules in an effort to make them more equitable, according to the FCC staff.

WHAT DOES THIS REPORT MEAN TO YOU?



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                                     TOTAL      TOTAL    -- PS/PO ---    -- OTHERS --
VOLSER  DEVTYPE   AOAYS    ADATE     OSNS      TRACKS    DSNS  TRACKS    OSNS  TRACKS
TS0001  3380        30     83365       92        1824      89    1724       3     100
                    60     83335       80        1600      79    1524       1      76
                    90     83305       72        1478      74    1478
                   120     83275       72        1478      74    1478
                   150     83245       72        1478      74    1478
                   180     83215       72        1478      74    1478

                                     TOTAL      TOTAL    -- PS/PO ---    -- OTHERS --
VOLSER  OEVTYPE   AOAYS    AOATE     OSNS      TRACKS    OSNS  TRACKS    OSNS  TRACKS
TOTAL   3380        30     83365     1523       19800    1467   17924      56    1876
                    60     83335     1493       18776    1446   17100      47    1676
                    90      3305     1492       18700    1446   17100      46    1600
                   120     83275     1492       18700    1446   17100      46    160
                   150     83245     1486       18100    1446   17100      30    100
                   180     83215     1486       18100    1446   17100      30    10

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                 TOTAL   --- ALLOCATED ---   -- INCREMENTAL --   ---- SAVINGS ----
VOLSER DEVTYPE  TRACKS   TRACKS  OSNS  PER   TRACKS  OSNS  PER   TRACKS  OSNS  PER
MVSYS1 3380      13275     7359   124  56%     3947    91  30%     3412    33  46%
MVSYS2 3380      13275    11223    97  85%     1634    18  12%     9589    79  86%
TS0001 3350      16650    16125   968  96%     4015    29  24%    12110   939  75%
TS0002 3350      16650    15500   812  93%     3900   150  23%    11600   662  74%

                 TOTAL   --- ALLOCATEO ---   -- INCREMENTAL --   ---- SAVINGS ----
VOLSER OEVTYPE  TRACKS   TRACKS  OSNS  PER   TRACKS  DSNS  PER   TRACKS  OSNS  PER
TOTAL  3350      33300    31625  1780  95%     7915   179  24%    23710  1601  75%
TOTAL  3380      26550    18582   221  70%     5581   109  21%    13001   112  70%
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AT&T challenge to IBM: Much talk, little action

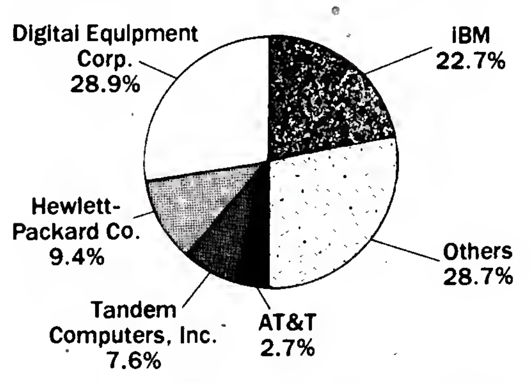
By Paul Korzeniowski
CW Staff

King Kong vs. Godzilla.

It was generally felt last year that the data processing world would be rocked by a battle royal between IBM (King Kong) and AT&T (Godzilla). Freed from its regulatory chains Jan. 1, 1984, AT&T has possessed the financial and technical muscle needed to loosen IBM's stranglehold on the computer industry.

Since that date, AT&T has introduced three computer lines: a 3B line of multiuser Unix systems in March 1984; the AT&T 6300, an IBM Personal Computer-compatible microcomputer, in June 1984; and the Unix PC in March 1985.

Medium-size system market 1984



Source: International Data Corp.

To date, no AT&T computer product line has challenged the market leaders. As a result, a number of predictions have been tempered, and some computer industry interpreters are beginning to doubt that the communications giant will ever pose a Godzilla-like challenge to the industry's King Kong.

"Certainly, AT&T's performance thus far has been disappointing," observed Gwen Peterson, director of business computer system industry service at Dataquest, Inc., a market research firm in San Jose, Calif. "The only business sector that has made volume purchases of AT&T products is [that of the] former Bell operating companies. Because of AT&T's assets and the technical achievements at Bell Laboratories, many people expected AT&T to quickly sell a lot of computers.

"Expectations were also great in the early 1970s when [Exxon Corp.], with a lot of cash, entered the high-tech field," she added. "Yet Exxon never sold many systems."

Exxon recently abandoned its computer sales and sold its office automation line to Harris Corp. [CW, March 4].

"AT&T will need a lot of time before it learns how to sell computer equipment," Peterson explained. "The company has already learned that selling computers in a competitive environment is much different [from] operating a monopoly."

Industry observers explained that a primary difference is marketing. In the face of little or no de facto competition, there is no pressing need to market a product intensely. When there is stiff competition, marketing often determines a product's success or failure.

AT&T's products have been technically sound, but the company has not formulated a coherent marketing plan, according to Richard Ross, director of industry services at the Gartner Group, Inc., a market research firm in Stamford, Conn. The communications giant appears to be marketing its products as competitors to IBM products.

"AT&T is not competing with companies like [Digital Equipment Corp.]," maintained James Sullivan, senior analyst at Yates Ventures, Inc., a Los Altos, Calif., market research firm. "DEC is too small. AT&T has the resources to compete with IBM. The communications company is used to being No. 1 and is striving to be No. 1 in the computer industry."

AT&T's success hinges on MIS managers' acceptance of its products. A sampling of MIS managers by *Computerworld* found few interested in AT&T's systems.

"AT&T's reputation works in a negative way," explained Steven Radice, director of information services at the Florida Federal Savings and Loan Association in St. Petersburg, Fla.

"When I think of AT&T, I think of a complex bureaucracy that is new in the computer field," Radice noted. "IBM is also a bureaucracy, but I know how to work with it. There is no reason for our company to be interested in AT&T products."

To garner interest, analysts suggested that AT&T must market its principal offering, Unix, and primary strength, an ability to integrate voice and data.

Often, product awareness does not translate into product sales. Although MIS managers were quite aware of Unix, few had considered purchasing it.

"I see no reason to move to Unix and be in the forefront of technology," Radice noted. "With our current investment in MVS training and software, Unix would have to offer us significant benefits for us to ever consider purchasing it."

Rather than substantial benefits, Unix offers a number of problems, according to some. "Unix does not have file-locking and security features found in other operating systems," Dataquest's Petersen explained.

Personal computer sales (units)

Product	1984	1985
IBM Personal Computer	880,000	1,050,000*
Apple Computer, Inc. Macintosh	275,000	420,000
AT&T 6300	33,000	70,000
AT&T Unix PC	—	18,000

* Includes anticipated IBM PC2

Source: Inforcorp

Some of these deficiencies were overcome on the version that runs on the Unix PC. However, there is some question concerning how compatible

See **AT&T** page 9

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Richard Ross, director of industry services at the Gartner Group, Inc., a market research firm in Stamford, Conn., had three suggestions. First, he would cut AT&T's work force by 25%. Next, he would revamp all factories so the company could truly become a low-cost producer.

"Also, I would drop out of the desktop market for the short term," he said. "AT&T is just not ready to really compete in that market. It should concentrate on the communications and network management markets, businesses that it is familiar with. AT&T would then be able to use that success to enter the desktop market."

Gwen Peterson, director of business computer system industry service at Dataquest, Inc., a San Jose, Calif., market research firm, suggested a directly opposite tack. "First, AT&T has to be successful in the desktop market," she said. "The corporation should concentrate on departmental microcomputers, systems that tie into a [private branch exchange] or other communications systems. That area — integrating voice and data — is where its advantages lie."

James Sullivan, senior analyst at Yates Ventures, Inc., a Los Altos, Calif., market research firm, would round out AT&T's product line. He recommended a microcomputer that runs AT&T Unix and Microsoft Corp.'s MS-DOS operating systems. "To an extent, the AT&T 6300 offers Unix and MS-DOS capabilities, but it's not full-featured," he stated. Other recommended products include a mainframe that runs Unix and a 6300-type machine with a $2,000 to $3,000 price tag.

— **Paul Korzeniowski**

Unix, graphics attract corporate users to AT&T systems

By Paul Korzeniowski
CW Staff

Few are the large corporations that have embraced AT&T's computers. Those that have been lured to the AT&T camp have often been attracted by features like Unix or the graphics capabilities of AT&T's 6300 microcomputers, according to users interviewed recently.

The Maybelline Co. in Memphis, a division of Kenilworth, N.J.-based Schering-Plough Corp., is somewhat of a Unix pioneer among large corporations. While most large companies have shied away from the operating system, the maker of Maybelline cosmetics began working with Unix two years ago.

The move to Unix was made after a careful examination of other small system alternatives, including IBM's System/36 and 38, according to Richard Whatley, vice-president of systems planning at Maybelline. "We found that Unix systems offered more features than the System/36 or 38 offered," he said.

> *'AT&T's salespeople have been very knowledgeable, and the systems have proven to be reliable.'*
>
> **— Richard Whatley**
> **Maybelline Co.**

At first, Unix applications were run on Tandy Corp. TRS-80/16B microcomputers. Last year, the division needed a more powerful piece of Unix hardware to power a new order entry application, according to Whatley. "Just as we were expanding our use of Unix, the [AT&T] 3B2 line was introduced," he said. "Since the hardware came from the inventors of the operating system, the 3B2 line seemed like a logical choice to us."

Whatley's division had been true to Big Blue, using an IBM 4381 mainframe as a departmental processor, a number of IBM Personal Computers and an IBM 3084 mainframe that ran corporate applications. The division has now purchased six 3B2s and several AT&T 6300 microcomputers.

Thus far, the Maybelline division has no regrets about its move to AT&T. "AT&T's support has been excellent," Whatley said. "If there is ever a problem, we have an 800 number to call. AT&T's salespeople have been very knowledgeable, and the systems have proven to be reliable. AT&T's support has been better than IBM's support."

Last year, Charter Medical Corp. of Macon, Ga., was looking for a medium-size, multiuser, multitasking system to run its purchase order system. "We examined a number of systems before choosing AT&T 3B2," Anne Mullendore, director of purchasing said. "The chief reason we chose an AT&T system was that the company promised to help us design our software."

The medical corporation's DP staff consists of 70 people working with IBM's MVS on an IBM 3083 mainframe and four people responsible for 3B2 applications. Today, the two systems work separately, but Mullendore predicted that soon they would be linked.

J. J. Kenney, Inc., a municipal securities firm in New York, wanted to integrate its Perkin-Elmer Corp. 3200 superminicomputer with personal computers. The company volunteered to be a beta site for the recently released AT&T Unix PC. "We liked the product's multitasking and windowing capabilities," a J. J. Kenney spokesman said.

Integrating micros and the supermini has proven helpful, but the integration is not complete. "We have to recompile personal computer programs so they will run on the larger system," the spokesman said.

Mediq Information Systems, Inc. in Pennsauken, N.J., needed powerful personal computer graphics capabilities for its radiology applications.

"The microcomputer had to support 64 shades of gray, which are needed to read certain X-rays," said William Adams Jr., the company's president. "The system can store digitized X-rays on a 3B2," Adams added. "The 3B2 is tied into an [AT&T] System 75 [private branch exchange], allowing a user to download the pictures to a 6300."

AT&T

from page 8

that version of Unix is with previous versions.

The gradual merging of voice and data functions may not prove beneficial to AT&T. "A number of companies have merged voice and data capabilities," Gartner's Ross maintained. "Telephone functions are being usurped by the data processing department, not vice versa."

For Godzilla to meet King Kong, these roadblocks have to be overcome. "AT&T will not be a major player in the computer industry for the next five years," Ross predicted. "It is questionable whether or not it will be a major player in 10 years."

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SETTLE from page 1

David Sturtevant, communications director for Adapso, a trade association representing 750 firms engaged in software and services, said the settlement was not forced by financial constraints and that Adapso had been willing to press the issue through a trial. However, legal communications provided to *Computerworld* indicated that Adapso had established a $10,000 budget for the case and was actively seeking a settlement.

Sturtevant declined to say how the alleged copying was discovered, but it was learned that Adapso had obtained internal Wilson Jones documents.

As part of the settlement, according to the statement, "American Brands and Wilson Jones share fully Adapso's and Micropro's conviction that software products should not be duplicated improperly, and they have agreed that appropriate procedures will be instituted to [ensure] against such improper duplication."

Adapso spokesman Sturtevant said Wilson Jones agreed to pay a cash settlement to Micropro, but he declined to specify the amount.

The suit, filed in Federal District Court in Chicago, had asked for damages of $225,000 and the return of any profits earned as a result of the alleged copying.

> ”
>
> *A spokesman for American Brands, Inc. said steps will be taken to ensure its operations have 'a much higher level of awareness' about software protection issues.*

Bob Rukeyeser, spokesman for American Brands, a Fortune 100 conglomerate with revenue of $7 billion, said steps will be taken to ensure its operations have "a much higher level of awareness" about software protection issues. He said he was not aware of any disciplinary action taken as a result of the lawsuit.

Although the statement did not say whether or not Wilson Jones management was aware of the practice, Rukeyeser said that "at senior levels nobody knew of it, and nobody agreed with it." Wilson Jones sells office equipment and supplies and at one time operated a business computer division that held membership in Adapso from April 1983 to February 1984.

The suit was a dramatic highlight to a broader education campaign designed to make companies and institutions aware of the illegality and penalties of unauthorized software duplication. Adapso has mailed out materials and offered advice on how companies and others can institute antipiracy policies.

Since the campaign was announced in January, Sturtevant said, Adapso has received 4,700 responses to its mailings, and more than 100 companies have provided Adapso with copies of antipiracy policies that have been developed or implemented.

Kodak Unix-based publishing system out

ROCHESTER, N.Y. — Eastman Kodak Co. announced an AT&T Unix-based electronic publishing system — the company's first thrust into the office publishing market — and the development of an image management system.

The Kodak Ektaprint Electronic Publishing System (Keeps) is said to automate the composing, printing and publishing of near-typeset-quality documents that merge text, business graphics and images.

The most basic Keeps configuration includes a Sun Microsystems, Inc. stand-alone graphics workstation, 42M bytes of storage on a Winchester-type 5¼-in. hard disk and a Canon, Inc. LBP-CX laser printer. The system runs under the University of California at Berkeley Version 4.2 of the Unix operating system, the vendor said.

Options include a Sun Microsystems text controller for word processing, which can support up to eight Esprit Systems, Inc. on-line Ascii text entry terminals; an Imagitex, Inc. graphics scanner; a file server node; a 1,200 bit/sec. telephone data modem and a printer that interfaces directly with the text cluster computers or individual graphics workstations to provide ready access to proofs.

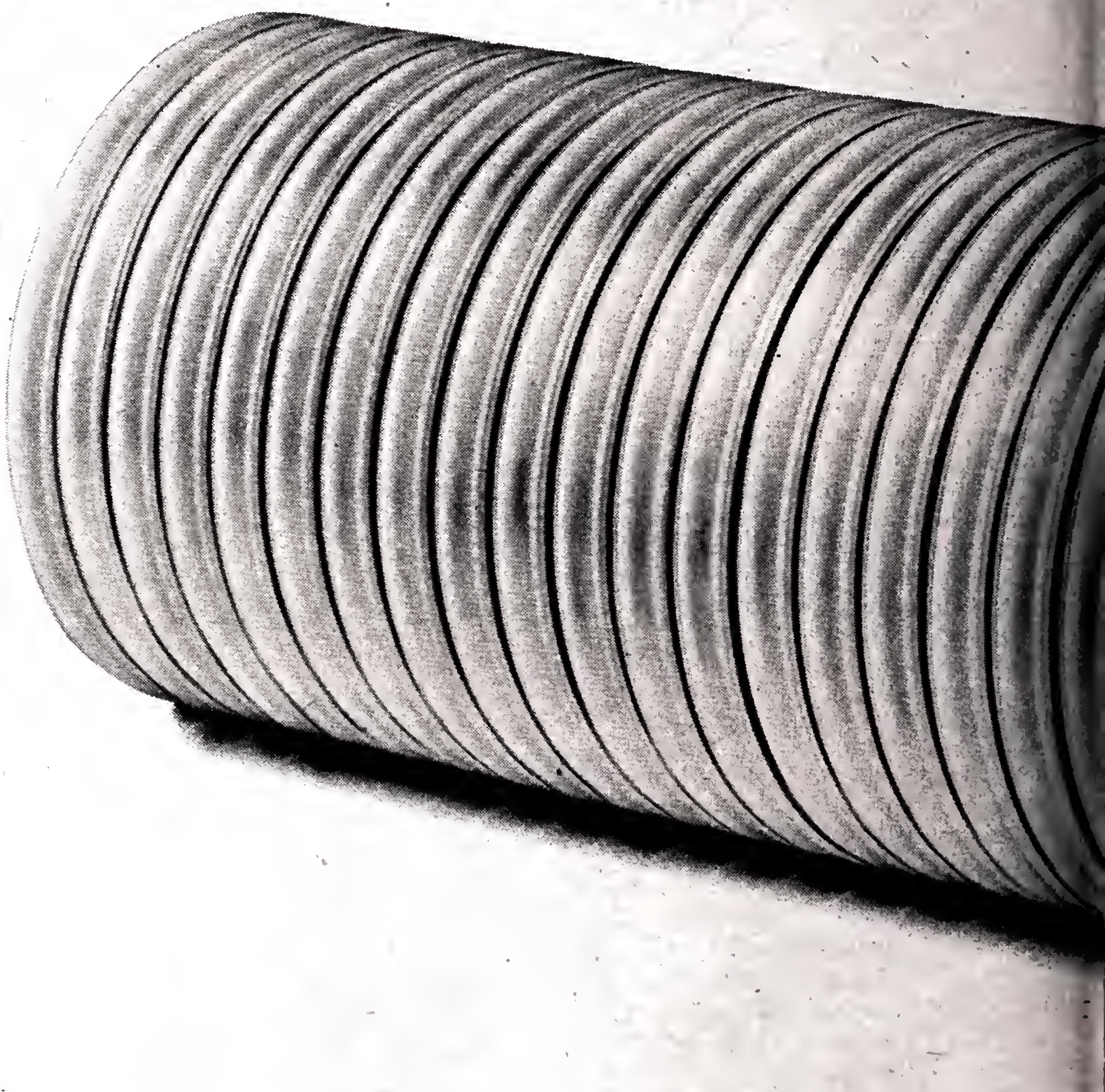
The system can allow file transfers from a customer's existing 7-bit Ascii word processing system or personal computer into the Keeps system, the vendor said. Users may change the type or size of fonts or other typographical elements as well as the size, proportion and position of graphics. Users may also preview how those changes will affect the document and how the document will look when printed out.

Software includes Interleaf, Inc.'s Workstation Publishing System for composition, Marc Software's Wordmarc word processing package and Kodak's proprietary software for linking the products and programs, the vendor said.

The system, the base configuration of which costs $50,000, is geared

See **KODAK** page 11

For fast relie



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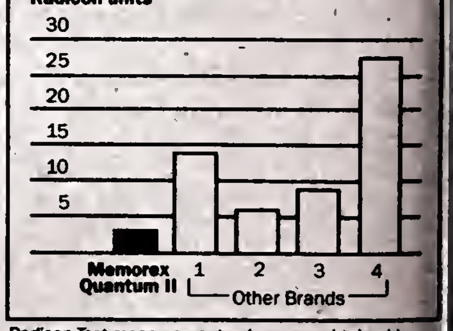


Radicon Test measurements above are obtained by running different computer tapes over an irradiated tap drive head. The higher the count of irradiated particles rubbed onto the tape, the more abrasive the tape.

Reagan tax reform proposal could raise hardware costs

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — President Reagan last week unveiled a major tax reform proposal that would slightly increase the cost of purchasing or leasing computer hardware, because the proposal would repeal the 10% investment tax credit for equipment.

James F. Benton, executive director of the Computer Dealers and Lessors Association (CDLA) here, confirmed that third-party lessors are likely to pass the increased cost from the loss of the tax credit along to customers. Likewise, users with tax liabilities who purchase hardware will lose that credit, thus increasing the after-tax cost of the computer by 10%, he said.

Explaining the tax reform proposal, Reagan said, "We are determined to cut back on special preferences that have too long favored some industries at the expense of others. We would repeal the investment tax credit and reform the depreciation system. Incentives for research and experimentation, however, would be preserved."

Reagan administration officials said repeal of the tax credit is needed to eliminate the investment bias in favor of equipment that qualifies for the credit and to eliminate the complex rules that define what is and what is not eligible for the credit.

Besides repeal of the investment tax credit, key provisions of the proposal include the following:

■ The top corporate income tax rate would be reduced from 46% to 33%.

■ The existing 25% tax credit for increased investments in research and development would be extended for an additional three years (until Dec. 31, 1988) and would be revised to target research that is likely to result in technological innovation.

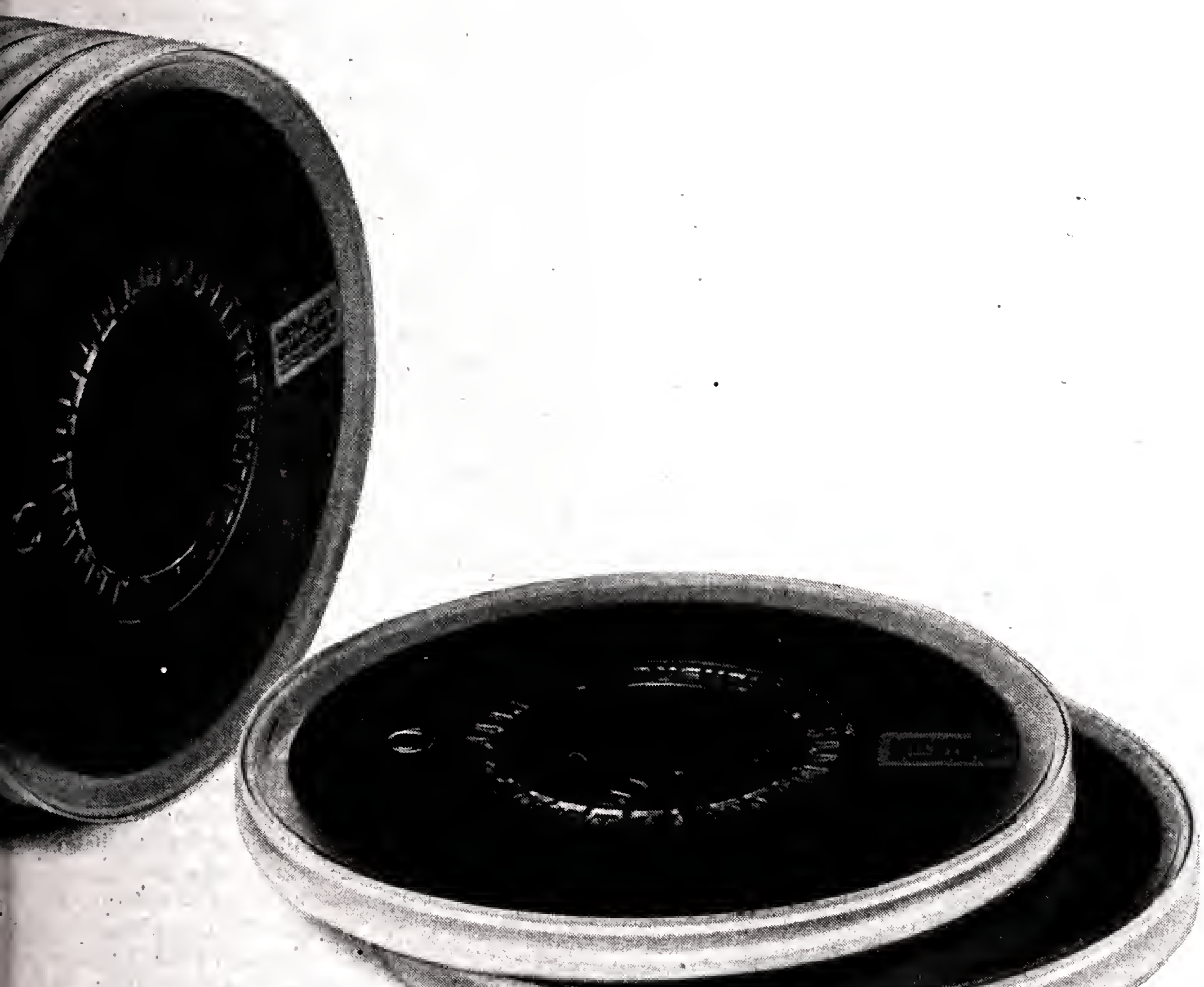
■ The maximum effective rate of taxation on capital gains would be 17.5%, compared with 20% under existing law.

■ The accelerated depreciation system enacted in 1981 would be replaced with a Capital Cost Recovery System (CCRS) that is indexed for inflation. Computers, depreciated in five years under existing law, would be placed in Class 2 of CCRS, which provides cost recovery in five years at a rate of 44% in the first year and 44% of the remainder in each subsequent year.

The good news, CDLA's Benton said, is that the Reagan administration not only abandoned its previous plan to increase the depreciation on computers from five years to eight years, but it also revised the depreciation system so that roughly 79% of the investment can be depreciated in the first three years (assuming a 5% inflation rate).

See **REFORM** page 12

of head aches.



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KODAK from page 10

to office or in-plant environments within Fortune 500 companies, the vendor said. It will be marketed initially in Kodak's regional marketing centers, including New York; Washington, D.C.; Chicago; Houston; and Los Angeles and will be available nationwide in 1986, a spokesman said.

The Keeps system that is being marketed at this time includes Version 1 of the company's software. The system that will be available by the end of the year reportedly will include Version 3 of the software, which will add functions such as graphics scanning, scanned image editing and multicolumn capabilities.

Kodak also preannounced its Kodak Image Management System (Kims) that is under development. The system is said to convert passive microimage files into active records that users can annotate as required. The Kims system — which will cost in the neighborhood of $450,000 — will be targeted at businesses with large data processing and document record-keeping requirements, like insurance and engineering firms, financial institutions and government agencies.

> ❞
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> *The Kims system — which will cost in the neighborhood of $450,000 — will be targeted at businesses with large DP and document record-keeping requirements.*

The system, which will be based on one of Digital Equipment Corp.'s VAX series machines under DEC's VMS operating system, is part of a joint development effort between Kodak and DEC, a DEC spokesman said. In its final form, the system's components will be networked on a Decnet-style local-area network and will be able to access data from IBM mainframes, a Kodak spokesman added. The system's autoloader machine is said to store 250 microfilm cassettes, or 3½ million pages of microfilm.

More information is available from Eastman Kodak, Rochester, N.Y. 14650.

MADONNA

from page 1

In its May 20 verdict, the jury agreed with Madonna's charge that NCR configured his Model 499 business system with a cassette tape unit that the vendor knew was insufficient in both capacity and access speed.

But in the same verdict, the jury also rejected Madonna's complaint against Lincoln Marini and Associates, Inc., a Fresno, Calif.-based program developer that was named as NCR's codefendant in the suit. When the plaintiff filed his legal action in May 1979, he accused Lincoln Marini of breaching its contractual obligations to tailor NCR's Construction Management System (CMS) package to Madonna's individual specifications.

The jury, however, absolved Lincoln Marini of any negligence in the case and blamed Madonna's own mismanagement for the programmer's failure to rewrite CMS' four application modules effectively, according to Wendt.

The jurors also accepted NCR's contention that the vendor "had, in fact, performed its contract with Madonna," Wendt said.

But in an accompanying decision that the defense lawyer labeled "inconsistent," the jury found the systems maker guilty of intentionally overstating the 499's technical capabilities, particularly those of its cassette unit.

"[NCR] didn't know or care whether the system was going to work for Madonna's construction company," according to the plaintiff's attorney, Marty Tangeman. "[NCR] decided a [cassette-equipped 499] was the right machine for my client because [it] had a software package for it, and [it] didn't have a package for any other machine. So [NCR] went ahead and sold it to him."

To support his charge, Tangeman cited NCR's alleged failure to analyze Madonna's systems requirements. "According to trial testimony, the first thing a vendor does before it configures a customer's machine is perform a systems analysis and survey the user's needs," he said. "Nothing of that sort was ever done in this case by NCR."

Evidence of NCR's alleged disregard for systems requirements is also present in the company's own internal sales documents, which suggest that cassette-based 499s are aimed at much smaller users than Madonna's firm, Tangeman said in court papers.

Such revelations apparently played a key role in convincing the jury that NCR had intentionally misrepresented the 499's capacity. Under California law, any business that knowingly deceives customers about its products or services becomes liable for punitive damages, which in NCR's case totaled $5.2 million.

In his complaint, Madonna portrayed his cassette-based 499 as a system so ill suited to its intended application that it reportedly prevented him from producing any job-cost reports for all of 1978. "For a construction company, job-costing reports are an essential management tool," Tangeman explained. "They're the only way a contractor can tell where he's having problems with a construction project and what he should do to correct them."

Even after 1978, when the reports finally became available, the system's storage capacity remained so restricted that it was unable to hold all the job-cost information Madonna needed to run his business effectively, Tangeman said.

Between 1978 and 1982, the absence of reliable job-cost data reportedly saddled Madonna's once-profitable firm with $7 million in losses, the defendant claimed.

Half a million in damages

Although Madonna sought restitution for the full amount, "the jury could pinpoint only half a million dollars in direct damages," said Tom Beisman, a Los Angeles-based consultant who closely followed the case.

Even so, NCR attorney Wendt termed the judgment "a clear example of a jury gone amok. We feel this type of punitive damage is becoming all too common in California and is beginning to hurt the business community."

Wendt also blamed Madonna's claimed business losses on the user's own mismanagement, rather than on the purported shortcomings in NCR's system, and disputed allegations that the 499's cassette module was too small for the construction company's volume.

REFORM

from page 11

Several of the provisions are more favorable to high-technology industries than the proposal made by the U.S. Department of the Treasury last year. For example, the Treasury Department plan would have taxed all capital gains as ordinary income, indexed for inflation, but that proposal was strongly opposed by venture capitalists and electronics firms.

William G. Moore Jr., chairman of the American Electronics Association, said the group will work aggressively for passage of the legislation and was particularly pleased by the capital gains tax cut and the R&D tax credit provisions.

Charlotte LeGates, spokeswoman for the Computer and Business Equipment Manufacturers Association (Cbema), said Cbema members had mixed reactions to the Reagan plan. On one hand, she said, they endorse the general concept of tax reform to reduce their high effective tax rates and support retention of the R&D tax credit. On the other hand, she said, they are very troubled by a complex provision that provides for the transition from the existing depreciation schedules to the new CCRS, which, she said, may increase taxes for the computer industry.

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Microrim implements user suggestions in Rbase upgrade

FIRST USER

By Paul Korzeniowski
CW Staff

The early users of Microrim, Inc.'s Rbase 5000, a data base management package that runs on the IBM Personal Computer, feel like proud parents. The users had worked extensively with Rbase 4000 and helped to conceive the new package.

"It didn't take me long to get Rbase 5000 up and running," noted Catherine Curtis, vice-president of research at Issaquah Group, Inc., a consulting and software firm in Orange, Calif. "I had sent Microrim a number of recommendations, and I wanted to see if they had been incorporated into the new product."

Curtis and other early users, all of whom received complimentary copies of the package, reported that most of their recommendations had been included in the new product. The package kept basic Rbase 4000 commands and functions but added a number of features.

Some new features centered on Rbase 5000's integrated report writer, which sold separately with Rbase 4000.

> ”
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> *'A user can still customize the program, but he won't be able to change portions of the code that shouldn't be changed.'*
>
> **— Catherine Curtis**
> **Issaquah Group, Inc.**

"With Rbase 4000, a user could only access one field in a report through a Lookup function," Curtis said. "With 5000, a user can access two or more fields and can combine a number of fields in a report."

Tom Mahon, industrial engineer at Construction Engineering Research Laboratories Corp. in Champaign, Ill., added that he is now better able to qualify data. For example, he can specify records with dates after January 1, 1985. "We can work with up to 10 qualifiers," he said. "Frequently, we use six or seven qualifiers."

John Harris, senior systems analyst at the personal computer support center for the city of Seattle, remarked that the report writer now supports subtotals and has made it easy for a user to set page formats.

Other enhancements consist of the package's ability to work with numbers. "There are extensive breaking and subtotal functions that allow you to develop accounting applications," Curtis claimed. "I would never use Rbase 4000 for an accounting application."

The experienced users have worked with Rbase 5000 to develop stand-alone applications for both themselves and end users. "We have 750 rifle range training facilities," noted Mahon whose company furnishes consulting services for the U.S. Army Corps of Engineers. "We have written a number of applications to schedule training times, track ammunition and automate other administrative functions."

Seattle's Harris wrote applications to track health organization clients, consultant services used by various departments and the status of a number of city contracts.

Issaquah's Curtis claimed that Rbase 5000 features enhanced applications development capabilities. "After you have written a program, you can designate certain portions of the code so a user cannot alter them," she said. "A user can still customize the program, but he won't be able to change portions of the code that shouldn't be changed. This feature is a valuable tool for an MIS manager who wants to retain some control over an application."

In addition to being a powerful tool for applications developers, early users said the package was simple enough for novices. Rbase 5000 features Application Express, which generates an application from a user's menu-driven input. "Novices seem to be comfortable with words like Select, so Rbase's command language is much clearer than that of other data base packages," Seattle's Harris said.

The users had worked with other data base management packages before deciding to use Rbase. "I worked with [Ashton-Tate's] Dbase II and found that it was unreliable," Curtis said. "There were a lot of bugs in the product." Harris added, "It would take 20 minutes for Dbase II to run an application that would run in a few minutes with Rbase."

Since many of their suggestions had already been incorporated into Rbase 5000, users cited few needed enhancements. "It would be helpful if Microrim's Clout (a natural language interface) was more closely integrated with Rbase 5000," Curtis concluded. "If it were, a developer could write applications that work with an English interface. Now, Clout can only be used to query a data base."

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Life on the hot line provides long-distance debugging

Most problems solved in 15 to 20 minutes

By Charles Babcock
CW New York Bureau

The phone rings.

'Hello, John? That bug was supposed to have been cleaned up in that version. Let me check engineering.'

It rings again, almost immediately.

'What version are you using, 83.1? Uh-huh. That's a known thing. There's a way to turn that off.'

So goes another day in the life of hot-line specialist Patricia O'Brien, one of 12 technical assistants at the Princeton, N.J., offices of Martin Marietta Data Systems. O'Brien answers hot-line calls on Martin Marietta's Ramis II, a data base management system, report generator and fourth-generation language package. As a specialist on how the software interfaces with IBM's IMS product, she gets some of the toughest calls.

"Sometimes, people are upset when they call in, but most are pretty reasonable," O'Brien said in a recent interview at her office. In fact, once, when she resolved a particularly nettlesome problem, the caller sent her a bunch of roses.

Another Martin Marietta technical assistant, Irving B. Kantor, appeared unflappable as he listened for several minutes to a caller's problem.

" 'Define' is already active because you activated it before you went through the files," he advised the caller.

Most calls are handled on the spot in a 15- or 20-minute consultation. A few, said Sue Goldberg, the Martin Marietta hot-line manager, can take most of an afternoon.

The hot-line technical assistants have a full library of reference manuals to back up their hunches on what may be wrong in a user's environment, and they frequently refer to the monthly engineering bulletins that are sent out to users advising them of special conditions and potential bugs.

Quick response helps

But there is no substitute for the knowledge in their heads or at their fingertips. It is the immediacy of their responses that helps convince callers that there is help at the other end of the hot line, Goldberg said.

Goldberg, 40, is a six-year veteran of manning hot lines, and when the traffic is heavy at Martin Marietta, she sets aside whatever she is doing and picks up the phone herself.

After identifying one caller's problem, she counseled, "I don't think we can zap it [do a quick change to the program code over the phone]. That's a problem that's been in the system for many releases."

A concern Goldberg shares with other hot-line managers is that "it's tough to talk to people only when they have a problem," she said.

"You can't expect a person to answer a phone eight hours a day. You lose empathy because you're not talking face to face," said Kenneth M. Schultz, manager of client services at Management Science America, Inc. in Atlanta.

Once, Goldberg recalled, she believed she was not making any headway on solving a problem with a caller and asked if she could talk to his systems programmer. "I am the systems programmer," he told her.

Such incidents underline the difficulty of long-distance dealings and "make you feel about this tall," Goldberg said, indicating a small amount with her hand.

On the other hand, some callers whom she has helped before, knowing her fondness for chocolate, include a one-pound bag of M&Ms when they send her a program dump.

In looking for people to staff the Martin Marietta hot line, Goldberg said, she looks for complementary personalities, and users frequently deal with the technical assistant of their choice.

Some assistants come out of other support roles in the firm, and some have programming backgrounds. But if an applicant tells Goldberg he loves to sit at a terminal and write code, "you know you've got the wrong person," she said. "You must be able to listen to people."

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PROBLEMS from page 1

"We asked one caller to copy the diskette he was using and send it to us. He went straight to the Xerox machine and copied it," Schultz said.

Troubleshooting is as much identifying the problem as it is finding the fix, Wright said. "It's kind of a mutual process. We are probing for information that the client may not feel is useful, but we have to put the pieces of the puzzle together," he said.

Frequently, the caller thinks he has encountered a bug in the software, and all three managers acknowledged that no major software package goes out bug-free. But "almost every environment is unique in some sense. The hardware or disk drives will be different," Wright said. Changes in the operating system, releases of the software or flaws in the way the package is installed can all lead to unexpected kinks, he said.

> *There remains no substitute for close, two-way communication.*

Although problems vary with the product, the three managers agreed to a large extent on the things a caller should be prepared to tell a hot-line troubleshooter. These include the following:

- What release of the product is being used? An eight-year-old package like Martin Marietta's Ramis II, with a fourth-generation language, data base management system and other components, has averaged two releases a year. Each has its modifications and idiosyncracies, and these are logged in bulletins and reference manuals, Goldberg said.
- What operating system is it running under? What version of the operating system and compiler is being used? Complicated software packages can have different idiosyncracies under different operating systems, Schultz said.
- If you are getting an error message, what is it? What is the exact wording? What is its number? Is it a message from the program or from the operating system?
- What part of the package are you using? A frequent cause of a program not doing what it is expected to do is the user following directions for one component while working in another, the three managers noted.
- How much memory are you using? If you are running a big application program, has it worked before? "Something that works with 10,000 records may not work with 100,000," Goldberg said.

Even after these questions have been answered, it can still be difficult to isolate the problem. In that case, all three vendors either ask to log on to the user's system through their own terminals and modems or try to simulate the problem on their own system.

At MSA, troubleshooters can duplicate problems under two different operating systems running on an IBM 3081 or 3033 mainframe, Schultz said.

A last resort is to ask the user to dump the program to the printer and send a printout to the troubleshooter.

Private-sector computer crime bill faces fire at hearing

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Rep. William J. Hughes (D-N.J.), chairman of the U.S. House Subcommittee on Crime, is plowing ahead with new computer crime legislation covering the private sector. But at a recent hearing, he faced criticism from the U.S. Department of Justice about specific provisions of his bill.

Taking the first step in the legislative process, Hughes chaired a May 23 hearing on his bill (H.R. 1001), which would create felony and misdemeanor offenses for computer crimes that produce illegal gains of $5,000 or more in one year and that affect interstate commerce.

Hughes said the U.S. government and the private sector have a dual responsibility in the area of computer crime. "Industry has to develop 'locks' to protect the intangible property in computer systems, and, when a federal interest is involved, the federal government has to provide the laws to prosecute those who break these locks and enter the systems," he said.

Hughes said the bill would restore provisions stripped from his comprehensive computer crime bill last year. In the closing days of the 1984 session, Congress enacted the Computer Fraud and Abuse Act to cover U.S. government computers and certain financial data bases [CW, Oct. 15].

At the hearing, Deputy Assistant Attorney General John C. Keeney said the Justice Department supports the goal but not the specific language of the Hughes bill. For example, Keeney said, the $5,000 financial gain requirement would hamper federal prosecutors because the amount of any financial gain may be difficult to prove.

Hughes responded that the $5,000 threshold was used to trigger federal jurisdiction, leaving lesser crimes to state and local authorities. Hughes said he would "take a second look" at the financial threshold.

Keeney urged that the computer fraud offense be rewritten so that it tracks the well-established mail fraud and wire fraud statutes and not require prosecutors to prove the defendant lacked authorization or that the offense affected interstate commerce.

In a more conciliatory tone, Keeney said these and other suggested changes were technical modifications intended to make computer crimes easier to prosecute.

Hughes

A representative of the Association of Data Processing Service Organizations, Inc. (Adapso) generally supported the Hughes bill but opposed the $5,000 threshold.

"While we understand the reasons for the dollar threshold, such a stated limitation may send the wrong message to 'hackers' and truly professional criminals . . . [by] implying that low-dollar computer crimes are tolerable," testified Adapso member P. Michael Nugent, government affairs counsel for Electronic Data Systems Corp. and representative of Adapso at the hearing.

George M. Minot, senior vice-president of Compuserve, Inc., testified on behalf of the Videotex Industry Association that the Hughes bill should be broadened to include such acts as password theft and attempted computer crimes.

Representatives of the American Civil Liberties Union and the American Society of Newspaper Editors expressed concern that the Computer Fraud and Abuse Act of 1984 may inhibit government whistle-blowers from disclosing computer-stored information about fraud and abuse in federal programs. The law makes it illegal to gain unauthorized access to information stored in a government computer and then disclose the information.

Meet to examine optical memory

TOKYO — Alan E. Bell, optical media researcher at the IBM Research Laboratory in San Jose, Calif., will be the keynote speaker at "The First International Conference in Japan on Optical Memory Technology," on Oct. 2-4 at the Keidanren Kaikan here.

Bell's address on "The Status of Reversible Optical Storage" will discuss both magneto-optic and phase-change technologies.

Seventeen speakers from around the world will discuss various aspects of optical memory technology. The conference is geared to technical, marketing and planning people in vendor and end-user organizations.

The conference fees are $715.50 before Sept. 1 and $795 after that date. The bound copy of the proceedings of the conference will cost $295.

More information is available from Technology Opportunity Conference, P.O. Box 14817, San Francisco, Calif. 94114.

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Why key DP/MIS managers are keeping RCA Cylix a secret.

WASHINGTON UPDATE
CW Washington Bureau

Board charges Treasury with failure to seek bids

WASHINGTON, D.C. — A federal appeals board recently ruled that the U.S. Department of the Treasury violated federal law last year when it tried to buy a $4.2 million package of IBM hardware without seeking competitive bids.

The ruling was issued by the General Services Administration's (GSA) Board of Contract Appeals, which settles disputes concerning government computer contracts.

In December the Treasury Department's Financial Management Service sought to buy an IBM 3081 mainframe, 16 IBM 3380 disk drives and eight IBM 3420 tape drives from the Federal Home Loan Mortgage Corp. (Freddie Mac), a government-chartered corporation. Treasury Department officials classified Freddie Mac as a federal agency, and thus could acquire the used hardware as an interagency transfer without seeking other bids.

Amdahl Corp. of Sunnyvale, Calif., which sought to sell its plug-compatible hardware to the Treasury Department, protested the arrangement on grounds that federal procurement regulations require "maximum practicable competition."

In a May 16 decision by the appeals board, Administrative Law Judge Cyrus E. Phillips IV said Freddie Mac is not a federal agency, and thus the Treasury Department should have sought more bids. Phillips also revoked GSA's authorization for the Treasury Department to purchase a computer.

Bomb blast at Berkeley injures student; suspects, motive lacking

BERKELEY, Calif. — Investigators say they have no leads, suspects or possible motives for a booby trap bomb explosion in a University of California computer terminal room here May 15.

The explosion, the second such incident in three years in the same building, seriously injured the University of California electrical engineering graduate student who accidentally set it off. John Hauser, 26, of Richmond, Calif., suffered the loss of three fingers and sustained potentially permanent damage to his right eye when he ignited the bomb by opening the plastic box that housed it. He remains hospitalized in good condition.

"We think this was intended to maim or kill somebody, but other than that, we have no motive," said Sgt. Calvin Handy of the University of California at Berkeley Police Department. The campus police department, a fully authorized municipal force, is working with the San Francisco office of the Federal Bureau of Investigation on the case.

The bomb exploded in a room that housed four terminals linked with one of the Electrical Engineering and Computer Science Department's Digital Equipment Corp. VAX-11/750 minicomputers. Hauser had been working on an IBM Personal Computer for approximately four hours when he decided to open the package at about 1:30 p.m., according to Ruth Toby, the academic department's office manager.

The bomb was contained in a 3- by 6-in. plastic box with a three-ring binder attached to it by a rubber band. Toby said the box had been in the room for several days, and a maintenance employee, assuming it belonged to a student, had placed it on a table next to the IBM micro.

Electrical engineering Prof. Diogenes J. Angelakos suffered less serious hand injuries July 2, 1982, when a bomb exploded in a lounge area on a different floor of the same building that was the site of the most recent incident. Police are investigating a possible connection between the two events.

Congress lifts daily log rule for home micro tax write-offs

WASHINGTON, D.C. — The U.S. Congress recently enacted legislation repealing the strict record-keeping requirements for making business tax deductions for home computers, a provision enacted last year.

In the Tax Reform Act of 1984, Congress required daily logs to show that a microcomputer is used for business purposes more than 50% of the time in order to qualify for business depreciation and tax-credit benefits [CW, July 2]. But legislators and their constituents considered the log-keeping rules for computers and those for automobiles burdensome.

The repeal legislation deletes the word "contemporaneous" from the record-keeping rules and reverts back to pre-1984 tax law. However, beginning in 1986, taxpayers must have "adequate records or sufficient evidence corroborating their own statements" to substantiate deductions or credits, according to the legislative report.

Bulletin board holds status of licenses to U.S. exporters

WASHINGTON, D.C. — U.S. exporters who need to check the status of the Pentagon's review of their export license applications can obtain that information via an electronic bulletin board, officials said recently.

The Export License Status Adviser (Elisa) contains dual-use export license applications that the Department of Defense has received since April 19, as well as general messages about export licensing matters. The department reviews certain high-technology exports destined for Soviet bloc countries.

Elisa is updated daily and requires first-time callers to assign themselves a password that will be required for all later system uses.

NBS invites applications for robotics research grants

WASHINGTON, D.C. — The National Bureau of Standards' (NBS) Center for Manufacturing Engineering recently invited researchers to apply for financial grants for research on robotics and factory communications systems.

NBS officials said grants can be awarded for research in real-time control of robots and workstations, sensory systems, factory floor communications networks, distributed data management on the factory floor, robot metrology, robot vision and sensory modeling, application of expert systems and artificial intelligence to automated manufacturing systems, software engineering tools and quality control issues.

More information can be obtained from Philip Nanzetta, Automated Manufacturing Engineering Facility, Room B-12, Metrology Building, NBS, Gaithersburg, Md. 20899.

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DSS use ranging from modeling to integrating software

By Maura McEnaney
CW Staff

WASHINGTON, D.C. — Users' perceptions of appropriate decision support systems (DSS) range from completely integrated software functions to generic modeling structures.

That was the view of attendees at a seminar on DSS held here recently.

When Union Gas Ltd. was involved in a bitter takeover battle earlier this year, the Chatam, Ont.-based utility company used a 15-year-old financial modeling package to supply top management with crucial information about the takeover.

Today, Michael Blain, coordinator for user services at Union Gas, wants to give end users at his company easy access to corporate data information so that they can use retrieval tools and more up-to-date modeling packages to make business decisions.

At the DSS seminar, sponsored by Digital Consulting Associates, Inc. here, Blain said he was looking beyond modeling packages, considering the implementation of fourth-generation languages and data base management systems at his company.

"I don't think the definition of DSS has really changed much," he said. "Maybe it's just that there are new ways of supporting decisions other than modeling."

Union Gas is currently using an IBM 3081 for decision support and applications development functions, he explained. Currently, the company uses IBM's APL language, ADRS and Informatics General Corp.'s Answer/DB to create mainframe applications for data retrieval and modeling. Union Gas' supply division uses decision support tools to monitor gas levels, forecast sales, run analyses and produce reports and documents for federal reporting requirements, Blain said.

At American Express International Banking, Assistant Vice-President Henry Mariotti said DSS would enable his end users to do various forms of financial modeling. Because it deals only in very high-dollar volume international transactions, the bank's technology needs are not as great as those of a retail bank, Mariotti explained. Recent conversions of international applications from a Honeywell, Inc. DPS 6 mainframe overseas to an IBM 4300 in the bank's New York office has prompted Mariotti to pursue end-user tools such as fourth-generation languages.

For other users at the seminar, the concept of an integrated system that can provide decision support, graphics and data management capabilities is too futuristic.

"We've got to move slowly to bridge the [technology] gap at the company," said Fred Kimball, business systems manager at American Optical Co. in Southbridge, Mass. The safety products and ophthalmologic company purchased an IBM 4381 in December and is just beginning some homegrown attempts to give end users information, Kimball said. Workers at American Optical only recently discovered they could access reports via overnight batch processing. And although that may be considered slow in more automated companies, "it's months sooner than [workers] thought they could get it," he said.

American Optical would consider generic DSS before it approached any kind of integrated solutions, according to Kimball. "There's so much that needs to be done; we've got to crawl before we can walk."

ASM disclaims VDT hazards

CLEVELAND — Add the Association for Systems Management (ASM) to the list of groups rejecting claims that potential health hazards are associated with VDT use.

The ASM, an organization of systems and data processing personnel, recently announced its conclusion that VDTs "pose no known health hazard to workers despite claims of possible adverse effects [associated with] long-term usage."

The association, which represents approximately 9,500 members, said it based its statement on results from research conducted over the past several years by scientists in the U.S., Canada and the UK.

Improper lighting or uncorrected eye problems can be the source of visual difficulties often associated with the use of VDTs, according to the ASM.

Similar statements refuting the possible dangers of VDT use have been issued by the National Institute for Occupational Safety and Health and the American Academy of Ophthalmology, the ASM said.

Nevertheless, 9 to 5, the National Association of Working Women and the Service Employees International Union are among several groups that have criticized VDT use, maintaining that precautions must be taken before concrete evidence on the safety of the machines is available.

Legislation regulating VDT use was filed in more than two dozen states this year. Two states — California and New Mexico — recently adopted purchasing guidelines for state agencies that are acquiring VDTs.

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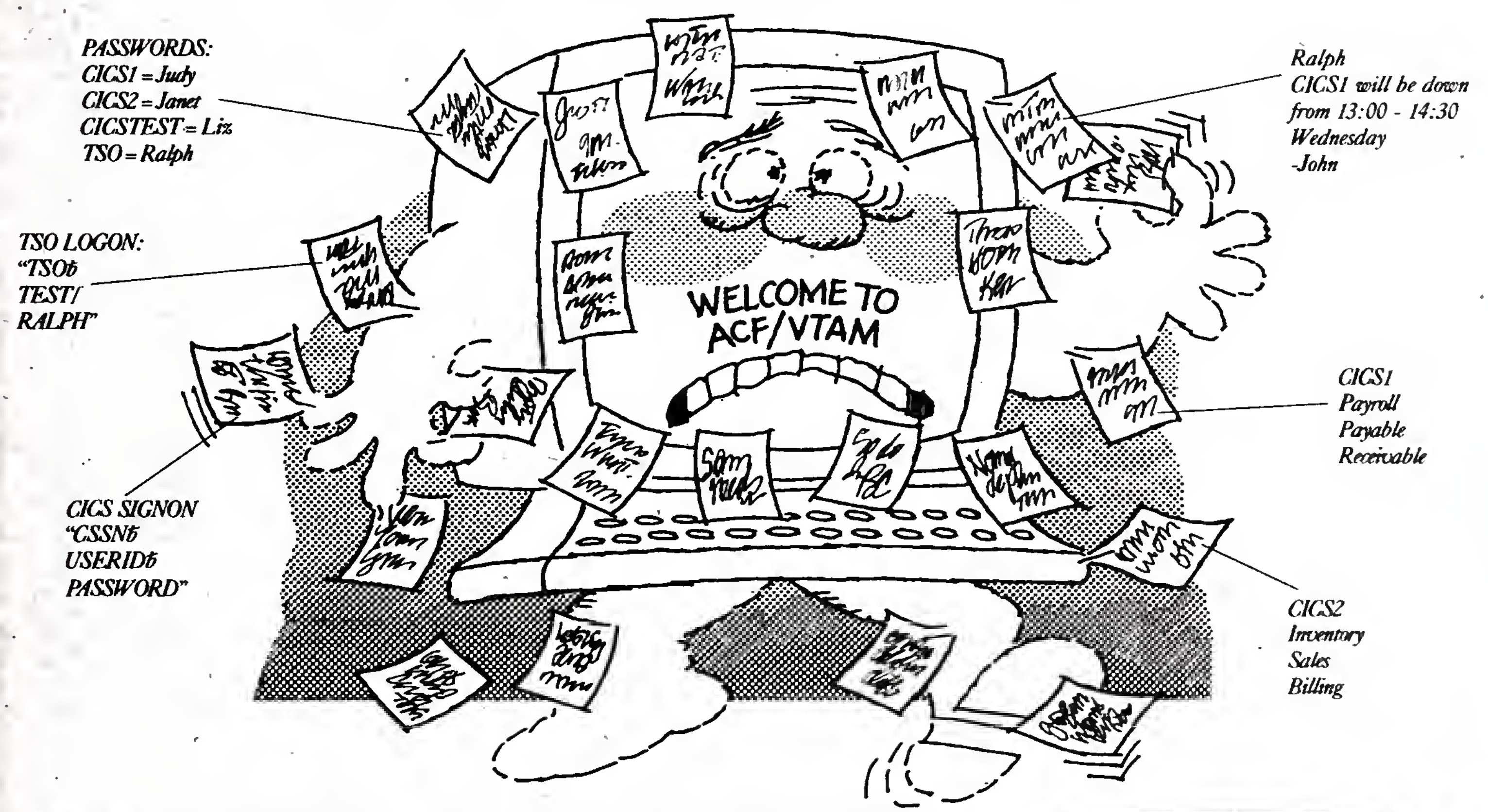

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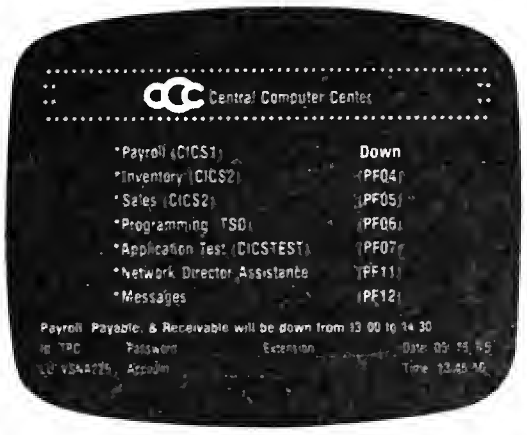

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DSS playing larger part in end-user productivity

By Maura McEnaney
CW Staff

WASHINGTON, D.C. — While they continue to play an important role in developing business modeling applications, decision support systems (DSS) today are increasingly being considered as end-user productivity tools, attendees at a recent seminar here were told.

"DSS is a critical subset of end-user computing," John Wark, director of systems software for Walker Interactive Products, Inc. said at a Digital Consulting Associates, Inc. seminar on DSS.

Wark, who conducted the seminar, defined DSS as "interactive systems that allow non-computer professionals to solve unstructured problems." Those problems, he said, can exist anywhere in the corporate structure, permitting DSS to be used in a variety of areas, including inventory control, production scheduling, tax planning, payroll analysis or production planning.

"DSS is no longer a modeling domain reserved for a set of specialists," Wark said. "Everybody realizes there is a need to implement effectiveness in decision making." That effectiveness will come when the end user works with DSS applications through the support of the information center, Wark said.

Aiding the decision maker

Today's DSS are aimed at aiding, not replacing, the decision maker, Wark said. "We can't identify the decisions we are trying to make without [the help of] humans," he said. DSS today must be easy to use, incorporate modeling analysis and take advantage of query and retrieval tools such as fourth-generation languages.

"Whether it is the marketing manager or the chairman of the board, there is a large need to meet the day-to-day needs of organizations," Wark said. Information reporting functions are essential for those day-to-day operations, according to Wark.

Programmer-oriented high-level languages and structured methods for developing applications will help but will not eliminate the problem of applications backlog and high end-user demand.

DSS technologies today incorporate data retrieval functions, data base management, analytical tools, forecast modeling, reporting and graphics functions, according to Wark. "The thrust in the marketplace is integrated technologies," he said.

Vendors that once supplied strictly modeling tools are being forced to provide data management capabilities in their products, while data management products are having modeling added as a capability, Wark explained.

Communication functions, or the ability of the program to convey results to the user, are crucial for DSS programs, he said. "The communication aspect of DSS is often overlooked. If you can't effectively communicate the [program] results, you are going to find it very difficult to get [managers] to support the decision."

More important, Wark said, are the "people issues" involved with DSS implementation.

Implementing DSS means a new relationship between data processing and the end user, who can now do modeling without the help of MIS. It also means potential conflicts among end users who are accustomed to informal information sharing.

Approaching the user with a service-oriented attitude is the best method for calming some hostilities, according to Wark. Relationships between working groups must also be formalized, he explained. Workers must get out of the user areas to discuss their working relationships, he said.

DP facilities listing out

NEW YORK — Computer Management Research, Inc. has announced the release of its "Mid-Atlantic States Directory of Computer Installations," which lists information about data processing departments in Pennsylvania, Virginia, Maryland, the District of Columbia, West Virginia and Delaware.

The 320-page directory includes company, division, address, type of industry, main telephone number, key data processing personnel, type of hardware, type of applications running, future purchasing plans and number of data processing employees at more than 16,000 installations. The manual contains 133 cross-references.

The book costs $295. Another directory, announced in January, lists New York, New Jersey and Connecticut installations and costs $370.

Computer Management Research is located at 20 Waterside Plaza, New York, N.Y. 10010.

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INTERNATIONAL REPORT
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AUSTRALIA

SYDNEY — IBM raised more questions about its strategy for dealing with AT&T's Unix than it answered at the recent Unixworld Expo '85 conference held here recently. Lief-Erik Kristiansen, a project leader for IBM's IX/370 version of Unix, confirmed IBM's support of AT&T's System V, Release 1 of Unix.

Kristiansen also noted that IX/370 was not a replacement for any existing IBM operating systems but rather an option that enables the vendor to offer IBM products to the growing Unix user community. Conference attendees were left confused by IBM's seemingly independent foray into the Unix arena.

CHINA

BEIJING — Tianjin Computer Corp. announced that it will begin mass-producing 16-bit microcomputers here under the terms of a recently signed agreement between General Robotics Corp. and the Coordinating Committee for International Security Export Control in Paris.

JAPAN

TOKYO — Toshiba Ltd. has acquired 20% of Ing. C. Olivetti & Co.'s subsidiary here. The terms of the agreement cover different areas of cooperation, including the availability of Toshiba products for sale by Olivetti Co. of Japan's worldwide organization.

Under the agreement, Toshiba will help Olivetti sell its product line in Japan.

Meanwhile, Ing. C. Olivetti has purchased 49% of Start Computer Center Gmbh of Munich, West Germany. Olivetti's interest in the computer retailer is said to be part of its strategy to become active in the retail form of distribution. The Italian company has already invested in other computer store franchises in the U.S., the UK and Italy.

■

TOKYO — NEC Corp. has introduced an Intel Corp. 80286-based machine here, signaling the beginning of what is expected to be a wave of IBM Personal Computer AT clones here. The PC 98XA machine is part of the vendor's PC 9800 series and works with both CP/M 3.1 and MS-DOS 3.1, NEC claimed. NEC's PC 98XA has a screen resolution of 1,120 by 750 pixels and a standard main memory of 256K bytes, expandable to 768K bytes. The system uses 5¼-in. floppy disks with 1M-byte capacity. The NEC machine is reportedly IBM Personal Computer XT compatible.

■

TOKYO — Fujitsu Ltd. has announced an expert software system called Eshell, which runs on its Facom M series of mainframes, S-3000 series of superminicomputers and Alpha and Lisp processors. Eshell is said to be a simplified program language for users unfamiliar with artificial intelligence or inference systems.

■

TOKYO — Japan's Ministry of International Trade and Industry (Miti) will reportedly form an industry information center to develop protocol standards for microcomputer communications. Miti is presently recommending the business protocol standard, which is based on layers of the International Standards Organization's Open Systems Interconnect model. At the same time, however, Japan's Ministry of Post and Telecommunications here has embraced a different protocol.

WEST GERMANY

HAMBURG — A shortage of qualified personnel is the most pressing problem for DP managers here.

According to Heinz Streicher of the consulting firm SCS GmbH, which conducted a poll on the subject, this situation will not improve in the foreseeable future. Finding experienced analysts and DP managers presents the biggest problem, Streicher said, and most companies (58%) wind up promoting people to these slots from within the organization. The policy in 80% of West German DP departments is to encourage continued education and training for their employees.

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JULY 2-6, SINGAPORE — **Computa '85: Fourth International Exhibition on Computer and Information Processing Technology for Asia.** Contact: ITF PTE Ltd., Suite 12-03, One Maritime Square, World Trade Center, Singapore 0409.

JULY 3-7, PARSIPPANY, N.J. — **CICS Command-Level.** Contact: Chubb Institute, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 5-6, NEW YORK — **IMS Recovery and Restart.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001

WEEK OF JULY 7

JULY 8, PARSIPPANY, N.J. — **Introduction to the Personal Computer and Personal Computer Software for General Business Audiences.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 8-9, BOSTON — **Successful Teleconferencing Systems.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 8-9, WASHINGTON, D.C. — **International Arms and Technology Transfer.** Contact: Technology Marketing Society of America Seminars, c/o Technology Training Corp., Department IATT, P.O. Box 3608, Torrance, Calif. 90510.

JULY 8-10, PARSIPPANY, N.J. — **Job Control Language.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JULY 8-10, BALTIMORE — **CICS Command-Level Programming.** Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

JULY 8-19, CHICAGO — **Pick Operating System Workshops and Seminars.** Contact: Jonathan E. Sisk, JES & Associates, Inc., P.O. Box 19274, Irvine, Calif. 92713.

JULY 9-10, SAN FRANCISCO — **Data Communications II: Digital Communications Systems.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 9-10, PARSIPPANY, N.J. — **Introduction to DOS for General Business Audiences.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054

JULY 9-11, SAN FRANCISCO — **Telecommunications Management.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

JULY 10-12, SAN FRANCISCO — **Local-Area Networks for the IBM World.** Contact: Communications Solutions, Inc., 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

JULY 10-13, LAS VEGAS — **The 60th Annual Convention and Trade Show of the National Office Machine Dealers Association (Nomda).** Contact: Matt Kaufman, Nomda, 810 Lively Blvd., Wood Dale, Ill. 60191.

JULY 11-13, TAIPEI, TAIWAN — **Asia-Pacific Regional Information and Micrographic Management Congress.** Contact: International Information Management Congress, P.O. Box 34404, Bethesda, Md. 20817.

JULY 11-12, DOOR COUNTY, WIS. — **First Annual Midwest Summer Computer Conference.** Contact: Technology Consulting Corp., P.O. Box 43, Sister Bay, Wis. 54234.

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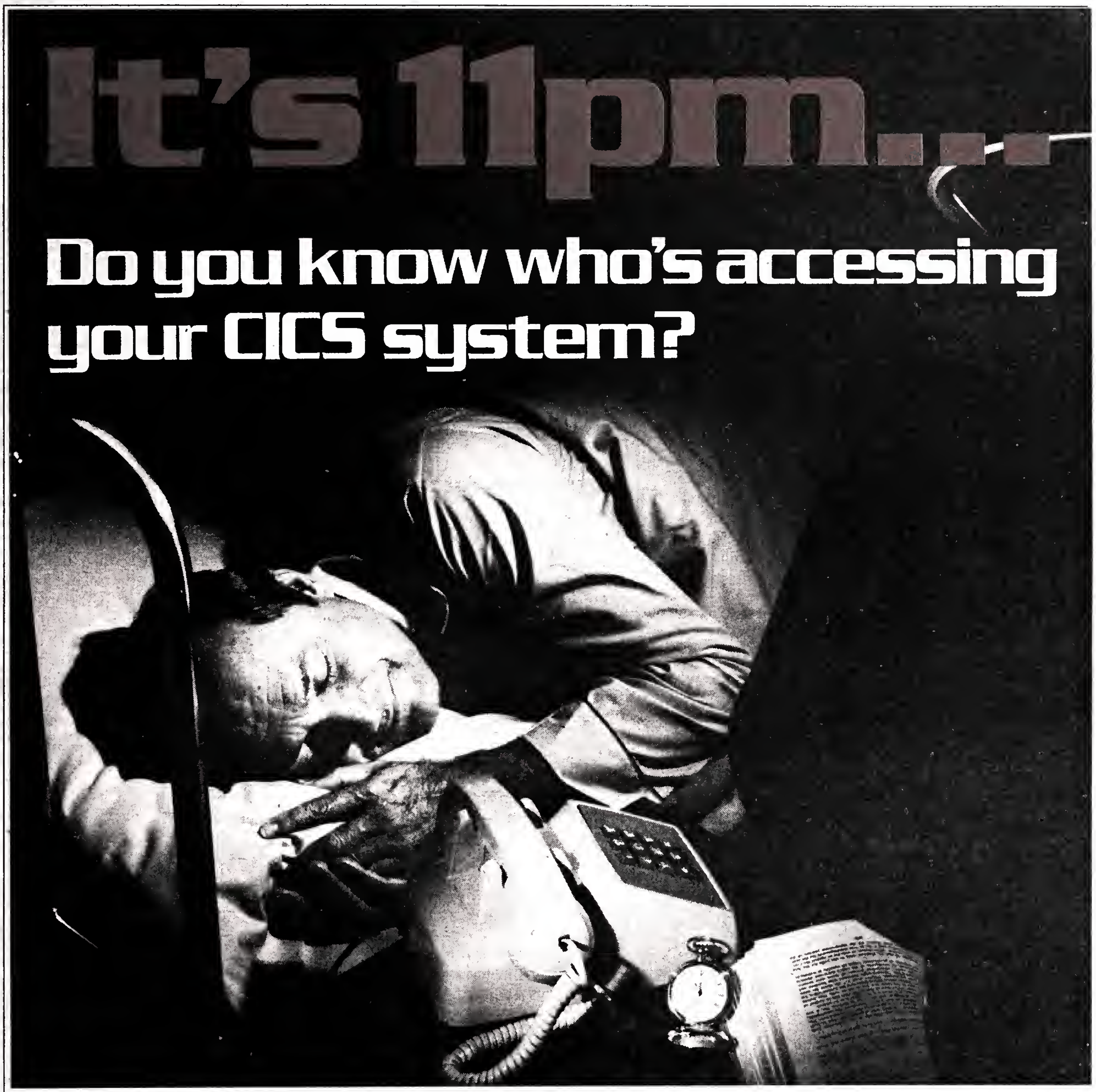
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EDITORIAL

Different breed moves into MIS

It sounds good: Chief Information Officer. CIO. It's the last step, the top of the heap, everything you've worked and sweated for all these years.

But it's probably not for you.

If you're a traditional DP manager from a traditional DP track, the job of CIO will probably go to someone else — someone with a broad business background — and that's hard to take. Here's a job that in many cases hasn't even been defined yet, except to say that it deals with the strategic, corporate use of DP, and people like the high-level task force that designed the job at FMC Corp. in Chicago [CW, May 13] are saying it shouldn't go to a DP manager.

Why not?

Most of the reasons have to do with the role the CIO plays in the corporation. The CIO is often a job created by demand at the top, by a recognition of the need for information about the company's business to be handled as a profit item in a strategic manner and on a companywide basis.

The CIO is a different breed, looking at the MIS department's information product as just that, a product, and at the company's information resources as just that, resources. His role revolves around strategic planning and standards setting for companywide information systems.

William Synnott, CIO at The First National Bank of Boston, described in a recent interview [CW, May 13] three major roles a CIO must be able to play:

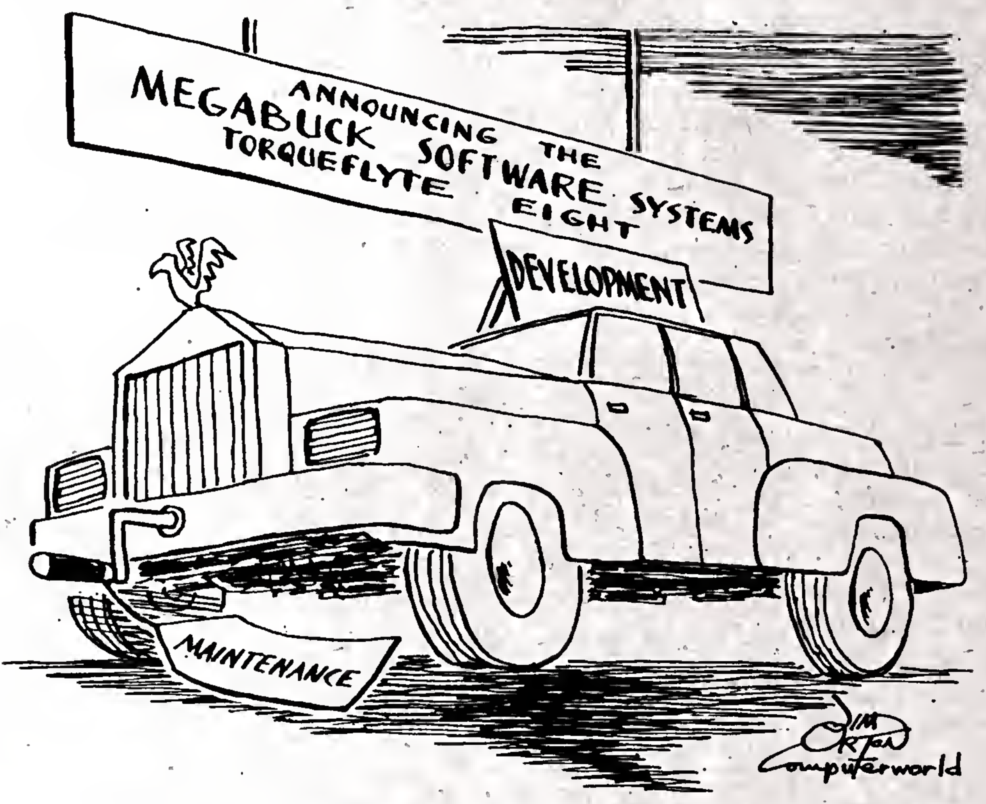
- **Businessman.** The CIO must have a thorough, detailed understanding of the company's business.
- **Manager.** The CIO must possess generalist management skills and must be able to manage any number of activities.
- **Technician.** The CIO must be able to use technology as a trade tool.

What are DP managers to do in this situation? First and foremost, they must concentrate on business. Not the information business — that should be a given — but the company's business. All the business information that flows through their department is a possible resource — a possible profit item if managed correctly.

But learning about business is not an easy task. Advanced business degrees are not the answer to every question. Synnott advised, "The only way to learn your own business is to be in the business." This may require what Synnott referred to as a change in alliance: a move away from involvement with finance and accounting to involvement with strategic planning, marketing and product management efforts within the company.

The CIO must also look for the opportunity. Technology can drive change in more ways than one. The job of CIO often is created when a company's information resources are fairly well distributed throughout the company's infrastructure — when there are goodly numbers of minis and micros in use, crying for a strategic plan to optimize their use. In such a case, the question "How?" has already been answered; the tools have been passed out. But the strategic question of "What to do?" remains unanswered in many cases, waiting for a CIO to set the course.

For today's DP manager, the job of CIO is a step up, a change for the better. But it demands corresponding changes from that manager — changes in orientation, in management style, in perspective.



LETTERS

Musician robot not the source of art

I was fascinated by the column "Robot pipes technology into the beaux arts" [CW, April 29] and by the account of the robot Wasubot and its organ performance. I believe that performance to be an incredible technological achievement.

However, I disagree that the Wasubot robot was used to create art. The art had already been created when the score was put to the paper. If Wasubot had done more than storing "the pattern of play in an output buffer" and then executing that pattern, I would be more inclined to agree that it created art.

If the robot had done something such as search a repertoire for other scores (patterns of play) and use them to make a new arrangement, then I would grant that art was created. Would it be correct to say that a person creates art when reading Hemingway?

Upon reflection, what Wasubot did was no different from the mechanical task of screwing lug nuts on a car with a programmed set of instructions, only its task was much more complex. The aspect that inspires awe is that Wasubot — a nonhuman pile of wires, motors and metal cases — produced a thing of beauty heretofore only associated with humans. We are used to having robots produce things like stampings or spot welds, but something as aesthetic as music is amazing.

With the advances in expert systems, consider the possibilities. Perhaps we could be looking at another Mozart.

Scott Gardner
Somerset, N.J.

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- 30 Medicine/Law/Education
- 40 Wholesale/Retail Trade
- 50 Business Service (except DP)
- 60 Government—State/Federal/Local
- 65 Public Utility/Communication Systems/Transportation
- 70 Mining/Construction/Petroleum/Refining
- 75 Other User________

Vendors
- 80 Manufacturer of Computers, Computer-related Systems or Peripherals
- 85 Computer Service Bureau/Software/Planning/Consulting
- 90 Computer/Peripheral Dealer/Distributor/Retailer
- 95 Other Vendor________

2. **OCCUPATION/FUNCTION (Circle One)**
- 11 President/Owner/Partner/General Manager
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- 13 Treasurer/Controller/Financial Officer
- 21 Director/Manager/Supervisor DP/MIS Services
- 22 Director/Manager of Operations/Planning/Administrative Services
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- 35 OA/WP Director/Manager/Supervisor
- 38 Data Comm Network/Systems Mgmt
- 41 Engr/Scientific/R&D/Tech Mgmt
- 51 Mfg Sales Reps/Sales/Marketing Mgmt
- 60 Consulting Mgmt
- 70 Medical/Legal/Accounting Mgmt
- 80 Educator/Journalist/Librarian/Student
- 90 Other________

3. **COMPUTER INVOLVEMENT (Circle all that apply)**

Types of equipment with which you are personally involved either as user, vendor or consultant
- A. Mainframes/Superminis
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- C. Microcomputers/Desktops
- D. Communications Systems
- E. Office Automation Systems

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VIEWPOINT

Micro saturation heightens need for control

THE DATA CENTER
John P. Murray

With the relative low cost and simplicity of microcomputers, people outside the information processing department are virtually stampeding to use them. Clients are able to do a great deal of their work independently when they want it and are often enamored with the concept of being freed from what they consider the unnecessary constraints and restrictions placed upon them by information processing. "Do your own thing without the annoyance of information processing red tape" is the current cry in many client departments.

The preceding paragraph is by no means "news." We are all aware of the burgeoning aspects of the micro culture. The benefits inherent in this growth, to clients as well as to information processing, are considerable. However, another aspect of this situation should make those of us with experience pause, and that aspect is control.

A faction that knows more than they understand about what they propose appears to be developing in some organizations. This is not a new phenomenon; clients have been quite able in the past to point out flaws in design and development work, often unhindered by any reasonable degree of knowledge.

I recall a presentation made by an MIS manager to a group of senior executives on the status of various development projects. As the manager began to discuss a proposed accounts receivable package installation whose completion was estimated at eight man months, a newly hired executive interrupted the presentation."I don't know anything about data processing," he said, "but I'm certain I could get an outside consultant and install that system in one man month or less." Such assertions are irritating but, at least in the above context, harmless. Although these clients may believe they can do a better job, they are usually not in a position to act. Such situations are common; it is easy to criticize knowing that you won't be asked to show results.

However, a somewhat different case arises when micros are the arena. Many clients are currently euphoric with being released from the shackles of MIS. Early and rather simplistic success encourages these people to strike out for more dramatic results. The plea becomes, "Let's put it in the personal computer." Doing so may be a great idea, but the problem involves making sure installation is done correctly and that adequate control, including documentation, is also installed and maintained.

Poorly written micro programs lethal

Ill-conceived and carelessly written programs without adequate controls are potentially just as lethal on a micro as they are on a mainframe. In fact, the programs may be more serious, if only because they are brought into production more quickly and may find their way into the mainstream of the organization sooner than more conventional systems.

Many have learned that strong, effective controls must be established and enforced throughout the information processing function. This is necessary to build a strong environment and maintain a consistently high level of accuracy and service. Of course, in some installations this concern with control has never been implemented, and the lack of that concern is evident. These installations have high levels of reruns, most of the work is carried on in a panic mode, and the accuracy of much of the input data, and therefore the information produced, is suspect. The cause — or at least a significant contribution to the cause — of such results can be traced to a lack of fundamental control.

It makes no difference how fast work can be produced or how easily answers may be obtained. The serious problem is that often times, because the work was produced on a micro, it is automatically considered valid. The feeling is that because "old Charley" did the work himself (and who knows more about *that* area than old Charley) it must be correct. The possibility that old Charley may have made invalid assumptions, used bad data or made errors in the program are ignored.

Micro control a difficult task

Any attempt to provide and enforce some type of control and structure on micro users presents a difficult and, perhaps in many organizations, impossible task. But some effort should be devoted at least to raise the issue and attempt to get senior management to consider the organization's needs in this area. The politics of this issue can be significant, yet someone needs to point out the value of adequate controls and the need for a reasonable level of constraint.

The consequences of everyone being able to "go their own way," use the data they want and disregard or change data that they think should be altered or not included because of some personal bias or because they desire to achieve a given result will become apparent someday. It is hoped the realization doesn't occur because of some incident that creates serious and far-reaching consequences for the entire organization.

The information processing department should work with micro users to help them expand their capabilities and to assure senior management that there is at least an awareness of the necessity for reasonable controls and that people are adequately concerned about the issue.

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Basic design-phase flaws hinder system development

READER'S PLATFORM
Bo Sanden

When mainframe software systems are constructed, an overall design phase usually precedes detailed design and programming. In the microprocessor world, we still seem to believe that our systems are so small and simple that overall design is not necessary.

However, with today's microcomputers and their communications capabilities, a micro-based system can be as complicated as a mainframe system. Still, management often refuses to see the need for qualified system design. Consequently, few people develop the necessary skills.

I manage a group that has taken over a distributed real-time banking system based on micros. We are responsible for the continuing installation of new nodes in the network for maintenance and further development. New functions are added when banking regulations change and as user needs warrant.

The old system was an on-line, data-entry application with a table showing what fields were to be entered as part of each transaction. There were a limited number of transactions types, each with an entry in the table. For each field, a validation routine was specified. It would, for example, validate the check digit of an account number or see if a date field contained the proper banking day.

The new application uses the data base interactively. If, for example, a check is received, the balance of the account is consulted before the transaction can continue. The transaction is executed in a branch office computer, but the balance record resides at a regional center, so the validation routine exchanges messages with the regional center computer. The data is used for further validations and finally updated and sent back to the regional center.

Thus the validation routines are no longer independent but tied together by an intricate set of variables, and when a certain condition is detected in one validation, a flag is set and then tested in other validation routines. One validation routine may be used for similar fields in different transactions. The actions vary slightly, so the routines contain direct tests on the transaction code.

From the old application we have inherited a main loop that interprets the field table and handles one field at a time for the current transaction type. In our application, this procedure depends rather heavily on the transaction type and can involve voucher printing, passbook printing and updating of certain accumulators. This is controlled by means of a set of special-action flags defined for each transaction type and also via direct tests of transaction code.

To further complicate the new application, two types of terminals have been introduced: teller terminals, which handle only a set of pure financial transactions, and administrative terminals used exclusively for another set, including opening of new accounts. The financial transactions have positive transaction codes and the administrative ones have negative codes.

The system is working well but is barely maintainable. We can still introduce a new transaction type or modify an old one, but other changes are extremely complicated. One teller transaction receives cash and documents and credits the total to a checking account. At one point we were asked to make a similar transaction available at the administrative terminal. It took months to find all the tests that had to be changed in a dozen different validation routines and in the main loop.

The direct cost in man months is not the greatest problem. Because each major change affects so many modules, we can handle only one or two in parallel. Otherwise the programmers would interfere with each other's changes. Furthermore, while a new release with a major change is being prepared, we have to issue subreleases with minor changes and error corrections, which also have to be included in the major releases. All of this severely restricts the possibility for us to develop the system further.

Our application has outgrown the simple table model on which it was based. Probably the behavior of each transaction should have been modeled as a subprogram, which in turn would call subroutines for the common field types.

Design work is creative and is therefore difficult to plan and manage. People in the fast-moving world of micros do not want to spend the necessary time on the intellectual design effort. Ironically, the lack of basic system design in our case turned out to be the most important money issue in the long run. Maybe the system will have to be prematurely abandoned when vital modifications can no longer be made at reasonable speed and cost. ‡

Sanden is in charge of a distributed systems project at Philips Data Systems in Monterrey, Mexico.

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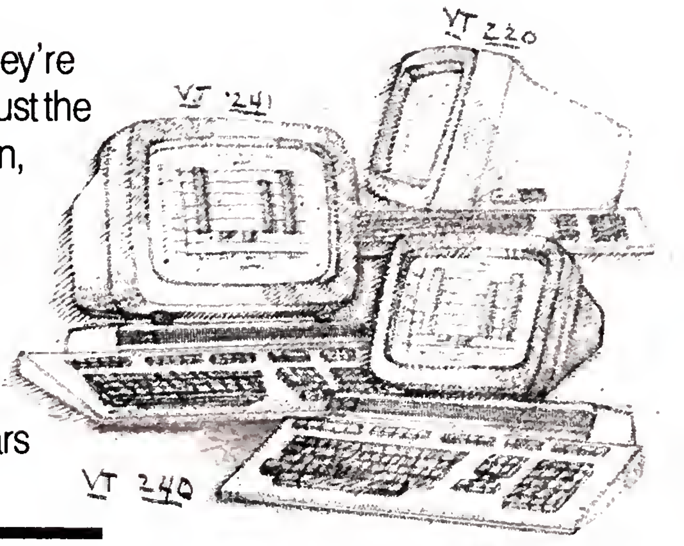

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SOFTWARE & SERVICES

‘Not for sale’ tool meets Xerox’s needs

By John Desmond
CW Staff

EL SEGUNDO, Calif. — An internally developed system used to track customer service problems at Software AG has become the software of choice for Xerox Corp.’s printing services division — even though it was not a marketed product.

The Xerox printing division implemented Software AG’s On-Line Customer Support System (OLCSS) in April after deciding to purchase Software AG’s Adabas data base management system, Natural fourth-generation programming language and Com-Plete teleprocessing monitor. It was during the DBMS selection process that the printing division personnel learned of Software AG’s in-house application, which the Reston, Va.-based firm then customized for Xerox’s use. The OLCSS currently helps Xerox manage several thousand field engineers and laser printer customers.

Xerox’s decision to modernize its manual customer tracking system was based on upper management’s commitment to improve customer service, according to Ken David-Adeleye, a Xerox customer support consultant who shepherded the OLCSS project. Xerox maintained the manual system of tracking customer service problems based on data supplied by field service engineers and not directly from customers, David-Adeleye said. But “the corporate commitment was that we would speak to customers directly,” he said.

After deciding he needed an integrated system to manage information, David-Adeleye concluded a DBMS was a must. “Being somewhat naive, I took a wide view of things,” he said. He looked at more than 100 DBMS products, eventually narrowing them to 32, including systems from Cullinet Software, Inc., Applied Data Research, Inc., Cincom Systems, Inc. and Information Builders, Inc. From his background as a systems programmer with

See **XEROX** page 36

- Dialogic Systems unveiled three products for its Dialogic/One mainframe application development system/**30**
- Plexus Computers offered an enhanced version of AT&T’s Unix System V for its line of supermicrocomputers/**31**
- Release 2.0 of its VMSecure IBM VM-based security software is out from VM Software/**31**
- Apollo Computer announced the Domain/Dialogue system to aid in the development of custom, menu-driven graphics interfaces/**36**

LU6.2: Behind the hype

SOFTALK
John Gallant
CW Senior Editor

Mercifully, a natural immune reaction protects one from becoming infected by the hype that pervades the software world. Common sense and skepticism rush to dispatch the industry-generated adjectives and hyperbole that threaten to overwhelm users.

If terms like “state of the art,” “leading edge,” “artificial intelligence based” and “revolutionary” were to vanish overnight from product literature and advertising, a collective sigh of relief would be exhaled by users and observers everywhere.

Most people have adopted a cautious, wait-and-see attitude toward new products and technologies. Software package A

See **SNA** page 34

Execucom packages bow

AUSTIN, Texas — Execucom Systems Corp., developer of the Interactive Financial Planning System (IFPS) decision support system (DSS), has introduced a presentation graphics package and a version of IFPS for the Apple Computer, Inc. Macintosh.

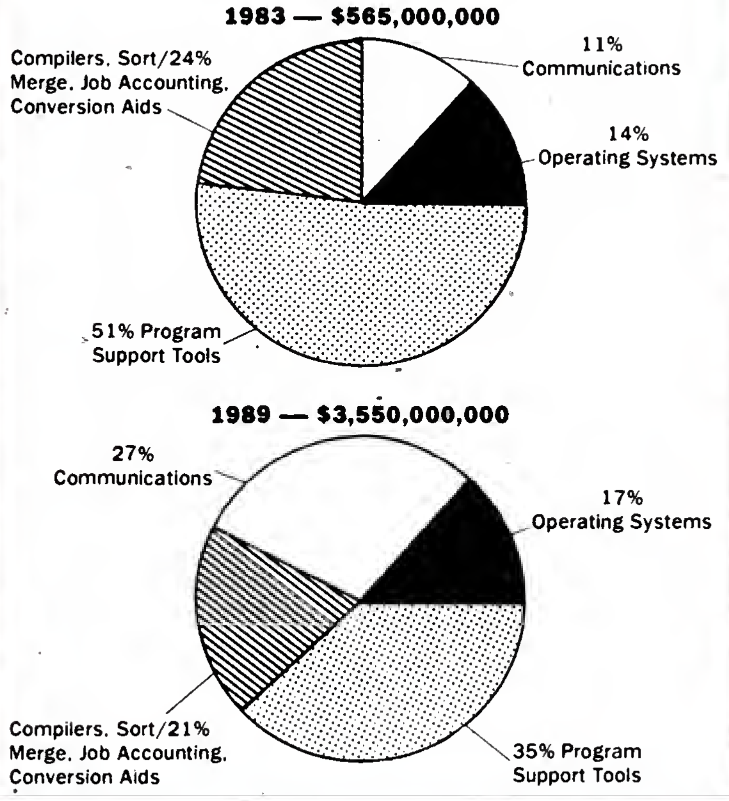
According to a spokesman, the Impressionist graphics system, which runs on processors ranging from mainframes to microcomputers, and the Mindsight Macintosh version of IFPS will be unveiled for the first time during Execucom’s June users group meeting. The products are scheduled for shipment during June and July.

Impressionist runs on IBM mainframes and Personal Computers, including the Personal Com-

See **EXECUCOM** page 31

SOFTSPOTS

SYSTEMS/UTILITIES SOFTWARE MARKETS: INDEPENDENT VENDORS, 1983 AND 1989



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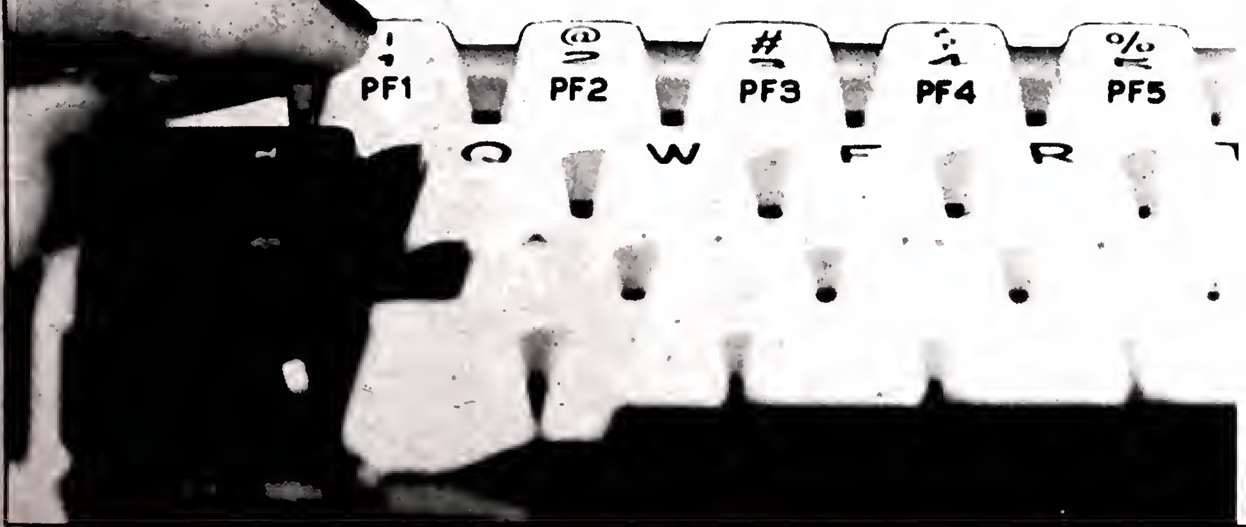

- **Session Switching**—allows users to easily switch in and out of any number of online applications
- **Help Desk Assistance**—users can send their screen to another terminal for help in troubleshooting
- **Automated Conversation Language (ACL)**—allows preprogrammed conversations to take place between the terminal and any application, such as logon/logoff

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Dialogic Systems adds application development tools

NEW YORK — Dialogic Systems Corp. has announced three products in the Dialogic/One application development system for IBM MVS/TSO/ISPF environments, including a remote-connect version that enhances the productivity of remotely located programmers.

Also announced were the Dialogic Cobol Editor for the editing and maintenance of Cobol programs and the Dialogic VTS/MA program for facilitating multiple concurrent TSO/CICS/IMS sessions for programmers in IBM shops.

Dialogic/One is composed of the Dialogic/10 Midframe Computer and associated software. The Midframe incorporates parallel Motorola, Inc. 68010 and 68000 microprocessors and a 400M-byte disk drive. The hardware is used to off-load the host and speed response time for applications developers. The announcements enhance existing features of the Dialogic/One Cobol applications development system.

According to a spokesman, the Dialogic/One remote-connect version works by off-loading interactive tasks onto a separate machine. The Dialogic Midframe is placed between the mainframe and IBM 3270 terminal cluster controllers. The ability of programmers to access data directly from the Midframe results in consistent subsecond response time.

Two models of the remote-connect version are scheduled for availability in the fourth quarter. Model 4 can handle up to 9,600 transactions per hour with 64 active users, while the Model 6 handles up to 14,400 transactions per hour with 96 active users. Prices range from $198,000 to $300,000.

The Dialogic Cobol Editor is said to reduce the number of mainframe compiles required. The product features many characteristics of a Cobol compiler, including dynamic syntax checking and a dynamic cross-reference facility. It also features a zoom capability and enhanced window manipulation. It is priced at $7,000 and is available now.

The Dialogic Virtual Terminal Session/Multiple Access (VTS/MA) is a window to the IBM MVS operating system that supports concurrent Dialogic activities. In addition to its editing capabilities, the programmer can execute TSO, IMS or CICS programs, commands or computer-intensive compilations on the host.

The Dialogic VTS/MA is said to extend the programmers' Dialogic session, releasing the terminal for other tasks while concurrently processing submitted work on the host. The VTS/MA program is a field-upgradable option, scheduled to be available in the third quarter for $10,800.

Dialogic Systems is located at 1335 Bordeaux Drive, Sunnyvale, Calif. 94089.

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IBM-compatible communications software debuts

CUPERTINO, Calif. — Motorola/Four-Phase Systems, Inc. has introduced micro-to-mainframe communications software that allows IBM Personal Computers and terminals with asynchronous communications capabilities to communicate with IBM mainframes through Motorola/Four-Phase's Series 4000 and 5000 minicomputers.

With MFE-Central, a Motorola/Four-Phase mini can function as a personal computer controller node. MFE-Central supports up to 16 micros or a combination of micros and asynchronous terminals that can be located remotely or locally.

MFE-Central allows personal computers to access the Series 4000 or 5000 via asynchronous protocols and exit the system through Motorola/Four-Phase protocols. By using MFE-Central as a micro-to-mainframe link, information can be downloaded from the mainframe and used on the micro.

MFE-Central costs $2,000. Network site licensing costs $40,000.

Motorola/Four-Phase Systems is located at 10700 N. DeAnza Blvd., Cupertino, Calif. 95014.

Instar creates escrow group

MALDEN, Mass. — Instar, Inc. has announced the formation of the Software Escrow Security Division to act as an escrow agent in administering software licensing agreements between developers and users.

Software Escrow Security will control access to source material as well as monitor update releases. Source codes will be stored in climate-controlled vaults at a data security facility in the East. All users pay an initial $200 for the service, which costs $300 per product source code stored per year on average.

Instar's Software Escrow Security Division can be reached at P.O. Box 0, 49 Clinton St., Malden, Mass. 02148.

Plexus offers supermicros Unix System 5 enhancement

SAN JOSE, Calif. — Plexus Computers, Inc. has announced an enhanced version of AT&T's Unix System 5, Release 2, for its line of supermicrocomputers.

Sys5.2 succeeds the company's Sys3 and offers a scatter-memory technique that permits programs to be written to memory in noncontiguous blocks, a spokesman said. The technique reportedly reduces disk swaps while permitting more and larger processes to reside in memory at one time.

Sys5.2 also offers a virtual protocol machine feature that is said to permit the downloading and uploading of files to IBM and compatible mainframes.

Sys5.2 has been extended to include the Plexus Network Operating System, which is said to provide Ethernet-based networking among Plexus machines.

Users reportedly can transport object code from Sys3 to Sys5.2 without modification.

Sys5.2 costs $2,000 for a 16-user system and $3,500 for a 32-user system.

More information on Sys 5.2 is available from Plexus Computers, located at 3833 N. First St., San Jose, Calif. 95134.

EXECUCOM

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puter AT and XT, and minicomputers from Digital Equipment Corp. and Prime Computer, Inc.

The product is said to generate a variety of graphics formats, including charts, diagrams and text images. It features a graphics editor and can be used with digitizers to create and modify images, the vendor said.

Impressionist, a high-resolution system, can be used to create slides, hard-copy plots and transparencies using a variety of output devices.. It interfaces directly to Execucom's IFPS/Personal, the IBM Personal Computer version of IFPS. The micro version is priced at $995, the mini version at $30,000 and the mainframe version at $40,000.

The Mindsight Macintosh version of IFPS is said to provide modeling, data management, goal-seeking and "what-if" capabilities and graphics and reporting tools. It uses Macintosh features such as icons, windows, pull-down menus, dialogue boxes and the mouse interface, the vendor said.

Mindsight reportedly can perform automatic solution of simultaneous equations, logical consolidation of models and data by variable name and financial, statistical and mathematical functions and subroutines. It is said to provide a full screen editor for creating and modifying models and data and an editor for entering, editing and calculating data.

Mindsight requires a Macintosh with 512K bytes of random-access memory and a second disk drive. It costs $595.

Execucom Systems is located at 3410 Far West Blvd., Austin, Texas 78731.

Availability of IBM IPDT announced

WHITE PLAINS, N.Y. — IBM has announced the availability of its Integrated Processing of Data and Text (IPDT) package. The package runs in IBM MVS and DOS/VSE environments.

IPDT allows IBM CICS users to access services provided by IBM's Distributed Office Support System and Personal Services/370 software, according to IBM. IPDT also reportedly can be used to create standard letters and forms and to compose documents from stored and keyed text.

IPDT for MVS (CICS/VS) is scheduled to begin shipping immediately. Shipments of IPDT for MVS (IMS/VS) are scheduled to begin in September IBM said.

The one-time charge for IPDT for MVS is $4,559 and for DOS/VSE is $4,564.

IBM is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

VMSecure gets system upgrade

VIENNA, Va. — VM Software, Inc. has annouced Release 2.0 of its VMSecure security system for IBM mainframes running under the VM operating system.

VMSecure 2.0 includes enhancements to its resource access control, user directory and disk space management capabilities. Users reportedly can now establish rules to indicate how their virtual machines and mini disks can be accessed by other users, while group managers can establish rules for individual identifications.

Other enhancements include a display of the date, time and terminal address of the last terminal session logon; a command-level report that lists attempts to log on, link, autolog spool and tag; and a report of activity in the virtual machine.

VMSecure 2.0 costs $14,000.

VM Software is located at Suite 355, 2070 Chain Bridge Road, Vienna, Va. 22180.

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The Tandy 1200 HD with 10-megabyte hard disk is now only $1999

How would you like a system that does everything an IBM PC XT does—but costs thousands less? Now the Tandy 1200 HD is only $1999 (was $2999 in Cat. RSC-14). That's $2396 less than the XT!

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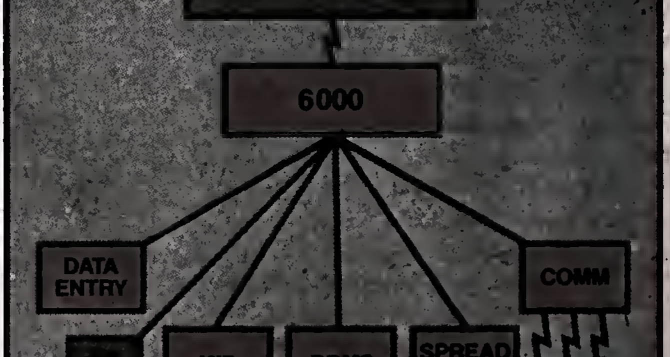

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SNA

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may actually represent a significant technological improvement over existing products. But users, analysts and consultants are likely simply to nod politely and suspend judgment until first-hand observation and experience supply them with the information needed to form an intelligent opinion.

No one wants to err on the side of overzealousness today. Even if the technology is highly advanced, the reaction of the populace may still be ho hum in nature. One tends to become jaded by the rapid pace of technology.

So when one encounters a consensus that a certain technology is truly revolutionary, one ought to sit up and take notice. Such is the case with IBM's 1982 Systems Network Architecture (SNA) enhancement called Logical Unit Type 6.2 (LU6.2) or Advanced Program-to-Program Communication [CW, May 27].

Never mind that you don't understand the workings of SNA. Like the fabled esoteric formula for Coca-Cola, probably only a handful of people really know what all the layers, Logical and Physical Units and protocols of SNA mean. If you were one of these people, you would likely be in a different profession — and probably a more lucrative one at that.

The gist of what anyone needs to know to understand the significance of LU6.2 can be summed up in just a couple of sentences. According to Robert Sundstrom, manager of communications systems architecture within IBM's SNA Group in Raleigh, Va., two software systems that support the LU6.2 protocol would be able to communicate as equals — that is, send and receive data on a peer-to-peer basis — within a network regardless of the type of host systems supporting them. When fully implemented, the hardware would become transparent to the communicating applications.

Ignoring the sophisticated technology at work and the expertise involved in bringing that technology to the fore, it is as simple as that. Now consider for a moment what that means. Processors of all shapes and sizes could conceivably be linked via software. Need some mainframe general ledger data to slip into your micro spreadsheet? No problem. Just issue the proper data base call and there it is.

The micro program would, ostensibly, be on equal footing with the mainframe or minicomputer application and would be able to send or receive information as required. In the current SNA setup, one machine is forced to play a secondary role to another, the primary processor, which controls all network communications from above.

Not surprisingly, your immune system has gone into high gear and is rapidly bringing to bear all the skepticism and disbelief it can muster. Simple software-to-software communications? Sure, you have heard similar claims in the past.

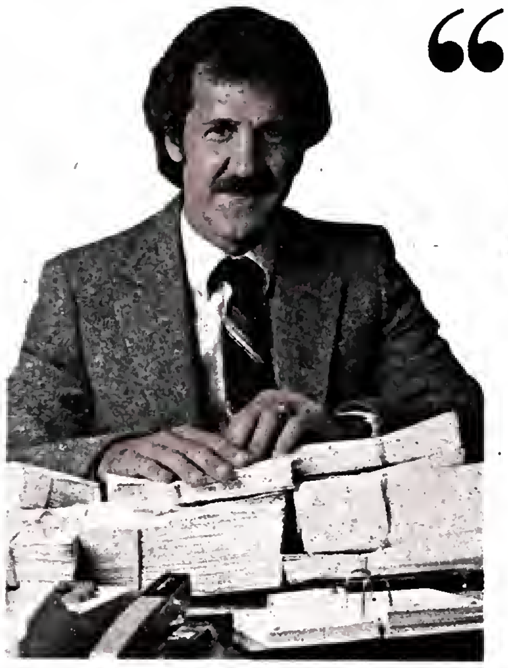
LU6.2 considered technical advance

But without exception, users, analysts, vendors and even IBM itself said LU6.2 represents one of the most important technological advances to come about in years. When asked whether LU6.2 would revolutionize intermachine communications, Sundstrom — who, you must remember, works for a company with a reputation for being tight-lipped second only to that of certain monastic groups — replied, "Yes, definitely."

That is quite an endorsement coming from an organization that crafts its statements of direction carefully enough to make the directives of the College of Cardinals look slapdash.

What does LU6.2 mean for you today? Probably not a great deal. The protocol is only supported by a minority of IBM's products. IBM's Personal Computer offerings supporting LU6.2 are particularly weak. You will not be using Lotus Development Corp.'s 1-2-3 to tap casually into IBM's IMS tomorrow.

But the wheels are in motion. IBM, by its own admission, is carefully assessing which of its systems will be first to support the protocol, and other vendors are moving to embrace the real opportunity LU6.2 represents. This is not to say you should pack your immune system into a drawer. But don't be too quick to pass this technology off as just some more hype.



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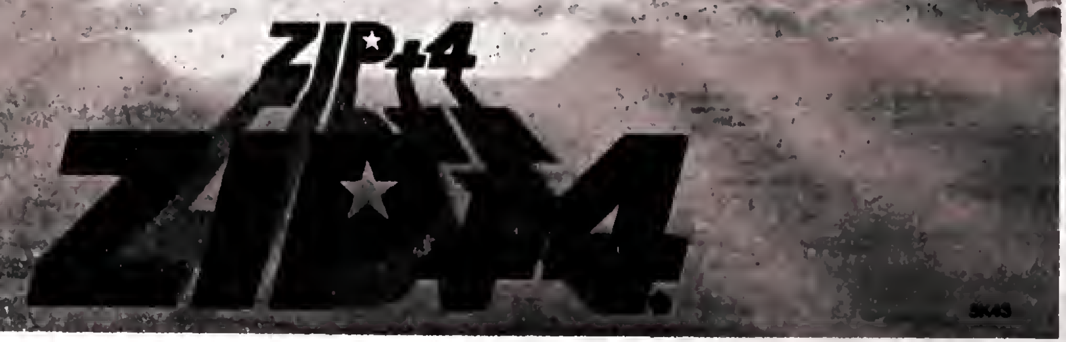

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XEROX

from page 29

experience in DBMS, David-Adeleye had a good grasp of technical details.

As David-Adeleye was narrowing down the DBMS choices, Xerox management decided the OLCSS should run on an IBM 4341 under MVS. Management also set an April 2, 1984, deadline for having the system up and running and serving customers. That gave David-Adeleye and two other members named to his team five months to decide on a system and get it in place.

"It was a major evaluation," he said. "One requirement was that the vendor provide extensive support. We're a planning organization, not a technical shop." David-Adeleye talked to customers of the vendors he had narrowed down and to senior executives in the vendor firms.

Vendor chosen

Based on what was said about Software AG, the technical aspects of its products and the company's commitment to provide the support Xerox needed to meet its deadline, Xerox chose Software AG as its vendor.

During the evaluation phase, David-Adeleye's description of the customer tracking system Xerox needed sounded more and more like Software AG's own system, dubbed Tsop, said Monte Hipple, Software AG senior account manager. David-Adeleye said Software AG's management was "a bit taken aback" by Xerox's interest in the internal program, but they agreed to customize it to meet Xerox's needs.

A major change to Tsop requested by Xerox was the addition of a mandatory key word structure. With the added function, a support specialist answering a hot line call from a customer is able to retrieve a standard solution to a problem. "It would have taken us at least a year to develop that functionality on our own," said Sharon Remer, a Xerox customer support consultant who joined the project team.

Time constraints

The Xerox OLCSS was brought up rapidly to meet the deadline. "The main problem was the time constraint," Remer said. Xerox's central DP division was hesitant at first to install the Com-Plete TP monitor, since they had just converted from Honeywell, Inc. hardware to IBM and were still on a learning curve, Remer said. "But we brought up Com-Plete with minimal support, and now the data center wants to use it for other things," Remer said.

CW PHOTO BY JOHN DESMOND

David-Adeleye, left, and Remer

Apollo introduces graphics interface building system

Domain/Dialogue designs, manages

CHELMSFORD, Mass. — Apollo Computer, Inc. has announced the Domain/Dialogue system for building custom menu-driven graphics interfaces.

Domain/Dialog runs under all Apollo operating systems, including Domain/IX, the company's implementation of AT&T's Unix.

According to a vendor spokesman, Domain/Dialogue includes the User Interface Design Kit for designing, testing and modifying user interfaces, and the User Interface Management System for displaying and managing the user interface.

The User Interface Design Kit provides a comprehensive set of building blocks, including switches, menus, icons, pop-ups, text input fields and scroll bars, which developers can use to customize interfaces.

Using the product's User Interface Description Language, designers specify the desired components and layout of an interface.

The kit also includes a Description Language Translator utility that builds the desired interface from specifications. The system is said to free applications developers from having to write code to create interfaces.

Interface management

The User Interface Management System displays, manages and maintains all aspects of the interface while a user application is running. The architecture of Domain/Dialogue allows for modification of user interfaces by separating interface software from the application. The feature lets users test and modify interface prototypes without affecting applications code.

The Domain/Dialogue User Interface Design Kit and User Interface Management System will be available on all Domain workstations within 60 days. The User Interface Management System will be included in the next release of all Apollo operating systems. The User Interface Design Kit, required by software developers, will be sold separately.

The Domain/Dialogue User Interface Design Kit costs $1,200 per node and $10,000 per site.

Apollo is located at 330 Billerica Road, Chelmsford, Mass. 01824.

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The Software Revolution: Trends, Players, Market Dynamics in Personal Computer Software

By: Robert T. Fertig
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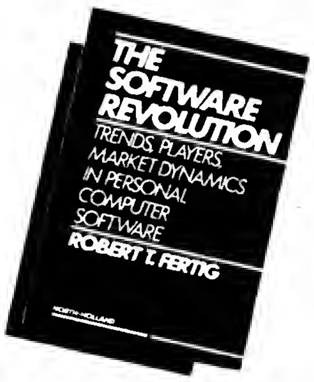
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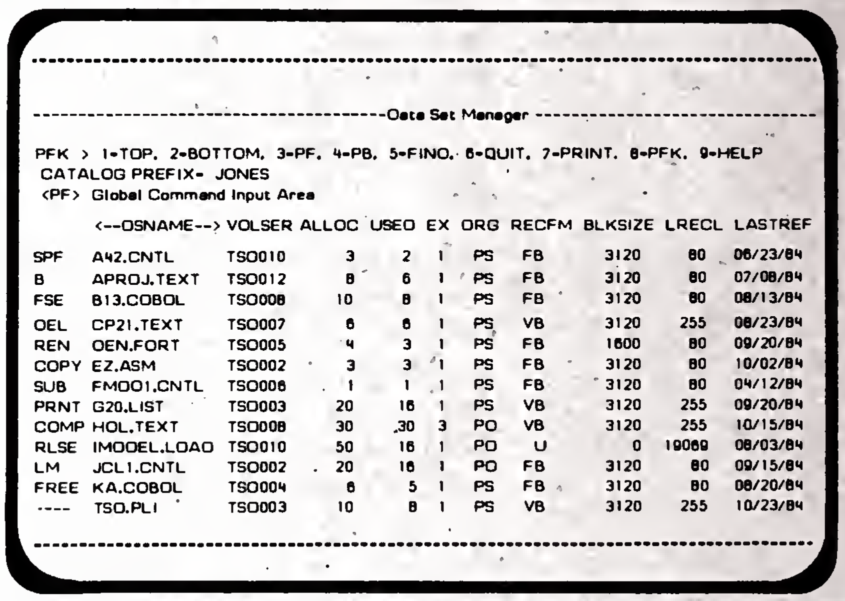

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 <PF> Global Command Input Area

     <--OSNAME--> VOLSER ALLOC USEO EX ORG RECFM BLKSIZE LRECL LASTREF

SPF  A42.CNTL     TSO010     3    2  1  PS  FB     3120    80 08/23/84
B    APROJ.TEXT   TSO012     8    6  1  PS  FB     3120    80 07/08/84
FSE  B13.COBOL    TSO008    10    8  1  PS  FB     3120    80 08/13/84
OEL  CP21.TEXT    TSO007     6    6  1  PS  VB     3120   255 08/23/84
REN  OEN.FORT     TSO005     4    3  1  PS  FB     1600    80 09/20/84
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SUB  FMOO1.CNTL   TSO006     1    1  1  PS  FB     3120    80 04/12/84
PRNT G20.LIST     TSO003    20   16  1  PS  VB     3120   255 09/20/84
COMP HOL.TEXT     TSO008    30   30  3  PO  VB     3120   255 10/15/84
RLSE IMOOEL.LOAO  TSO010    50   16  1  PO   U        0 19069 08/03/84
LM   JCL1.CNTL    TSO002    20   16  1  PO  FB     3120    80 09/15/84
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COMPUTERWORLD

Update

June 3, 1985

DP Pros: Where to find them
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TeleVideo corrects the VT220 key mistakes.

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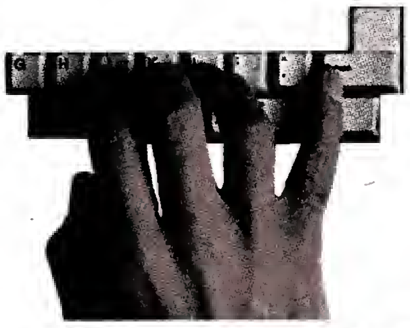
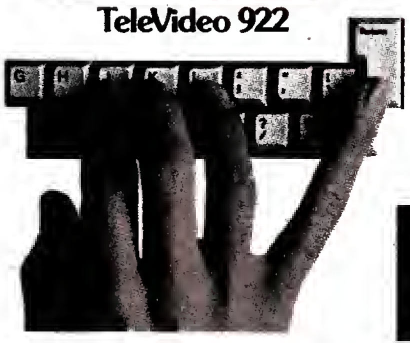
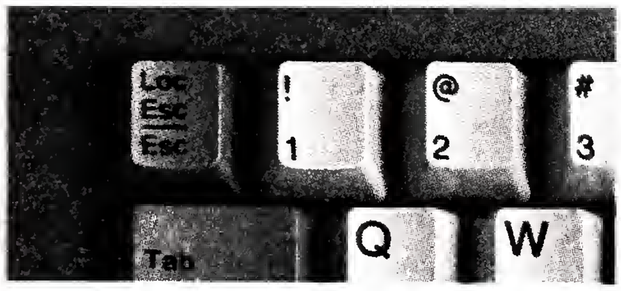
1. Take our keyboard, for example. The RETURN key is within direct, easy reach. But VT220 users must stretch over an additional key to hit RETURN. Or have the hands of a concert pianist.



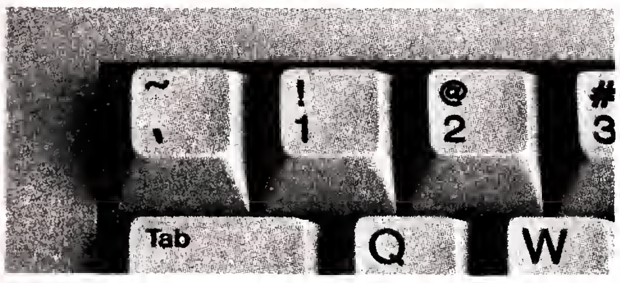
TeleVideo 922



DEC VT220



Here's ours.



Where's the VT220 ESCAPE key?

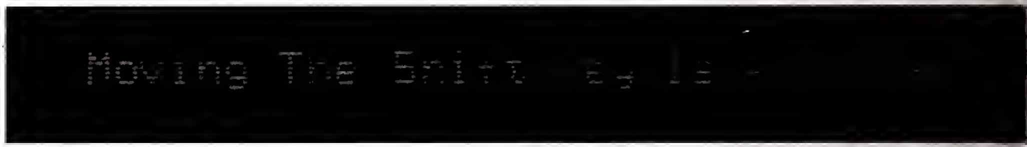
2. Our ESCAPE key is located above the TAB key, right where you'd expect to find it.

Theirs isn't.

In fact, you have to go hunt for the VT220 ESCAPE key halfway across the row of function keys.

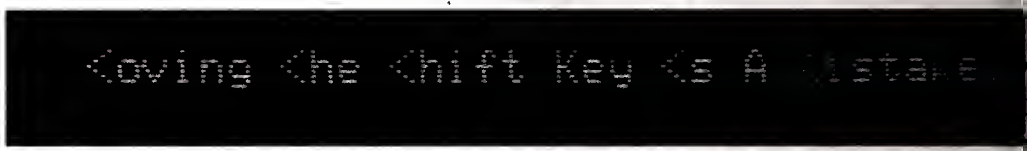
3. Take a look below at the 922 keyboard. That's a true accounting keypad, complete with a Clear Entry, Double Zero and a TAB key. Not merely the numeric keys you get with the VT220.

4. Our SHIFT key is exactly where it should be, so it does exactly what it should do—shift. Their SHIFT key is shoved over by the < and > key to create lots of < and > on the CRT. Of course with a little practice, you could relearn their keyboard. But why, now that you've seen our 922?



Moving The Shift Key Is

922 Display Screen.



<oving <he <hift Key <s A <istake

VT220 Display Screen.

5. And after we built a better keyboard, we built a better terminal. With exceptional reliability. Quality. Advanced ergonomics. Everything you'd expect from the industry ANSI leader.

The new 922 is available now and priced to move now. And it's backed by a worldwide sales and support network.

6. Here are 5 more advantages to the 922.

	TeleVideo 922	DEC VT220
Programmable Function Keys	15 (30 with shift)	15 (shifted only)
True Accountant Keypad	YES	NO
Plug-in Graphics Upgrade Option	YES	NO
Full Tilt & Swivel	YES	NO
Enhanced ANSI Mode	YES	NO

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Update

Finding and keeping DP/MIS professionals

By Glenn Rifkin
Update Editor

No single method has emerged as a sure way for recruiters to find the personnel they need. . . . And in an environment in which demand outweighs supply, employers find themselves in a tenuous position requiring creative, strategic thinking.

Choose a job you love, and you will never have to work a day in your life.
— **Confucius**

For DP and MIS professionals, the heat is on. Once an obscure, misunderstood function within the organization, "computer central" is now the focus of unblinking attention. As Fortune 1,000 firms turn the care and feeding of their precious information resources over to MIS, the DP and MIS executive is earning recognition and respect. Coupled with the fact that companies have come to realize that a quality DP worker is hard to find, the profession has prospered under the time-honored traditions of supply and demand.

Though colleges and computer training institutes continue to pour forth eager graduates and despite an industrywide slump among computer vendors, a great demand remains for high-quality, experienced DP professionals (see chart Update/4).

The issues surrounding the recruitment and motivation of quality employees are by no means restricted to DP and MIS. Volumes have been written on both hiring and management techniques in the general business setting. However, finding and keeping DP personnel does have its own special set of problems.

Companies, for example, are often restricted in their search for people by the specific hardware and software expertise they might be seeking and face the question of whether to choose machine experience or the overall quality of a candidate. Universities may produce excellent computer science graduates, but today's market often calls for a more well-rounded business education to complement the technical education.

The continuing shortage of manpower has put the seasoned DP worker in the driver's seat, and job-hopping and increased salary and benefit demands have often resulted. Since DP is a young profession populated by an inordinately large number of young people, there is a dearth of stability in the DP environment. Women have found their own set of problems surviving in the DP world (see story Update/11) and training DP and MIS managers requires special, far-sighted planning (see story Update/17).

In addition, as end-user computing becomes a de facto part of corporate life, DP and MIS professionals often need to acquire people skills to enhance their technical skills, a process often easier to talk about than implement. Also, studies have shown that social needs of DP professionals differ from the needs of other workers, often leading to conflict in the choice of career growth. For example, technical people in many cases simply do not make good managers and have no desire to be managers. Where, then, should they turn for advancement?

Though salary is an obvious motivator, technical people are generally more concerned with the technology and the task at hand. Their loyalty is often aimed at the profession instead of the organization, and companies face the prospect of losing good people if they cannot keep up to date with leading-edge technology.

Confronted with inflated DP turnover, organizations must find innovative ways to intertwine the DP staff further into corporate culture. Rather than have technical personnel feel isolated and unrecognized — viewed merely as an add-on service organization — companies must bring DP into the mainstream and clearly relate it to the corporate business.

Though the issues are complex, answers are being found.

Recruiting and hiring

"Plastics," advised the obtrusive family friend to a reluctant Benjamin in the 1967 film *The Graduate.* That, in a word, he insisted, was the future.

Were the same scene shot today, the advice might be "CICS" or "Unix" or "decision support." And the family friend would instead be the DP recruiter in critical need of staff. Ben would ignore this new advice as he did the old. But DP managers are hoping that other graduates will respond to the opportunities that await them in information systems.

Finding quality DP personnel is a real-world problem without easy celluloid solutions. Because of continuing shortages in a long list of DP and MIS occupations, recruiting and hiring quality candidates requires long-term planning and a commitment of resources. This must often be combined with nontraditional methods that buck practices on which personnel departments have relied for decades.

Entry-level workers are in constant demand. Even more prized by recruiters — and harder to find — are seasoned middle-level programmers, systems analysts, data base managers and operations personnel. "The schools are turning out a lot of computer science majors, so there are many good entry-level people," said Jane Hardy, a personnel specialist for the Gillette Co. in Boston. "And I'm always hearing about people at the DP manager level. What I'm missing are the ones in between, people with three to five years' experience who are doing well and making moves within their own company."

To that end, companies have turned toward such recruiting tools as executive search firms, job fairs and open houses, as well as intensified in-house training programs for employees from other disciplines looking to switch into DP. Though the "help wanted" sections of national publications continue to swell with calls for DP professionals of every

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COVER ILLUSTRATION BY KAREN WATSON

COMPUTER JOB OUTLOOK 1982-1995

POSITION	1982	1995 Alternatives		
		Low	Moderate	High
Programmers	263,817	450,516	466,589	474,904
Systems Analysts	250,634	454,740	466,724	475,628
Operating Personnel	578,989	726,544	736,255	751,559
Computer Operators	210,502	365,898	370,367	377,923
Data Entry Operators	319,446	281,670	285,708	291,987 *
Peripheral DP Equipment Operators	49,041	78,976	80,180	81,650
Service Technicians	53,771	104,743	106,632	107,446

* Note the decline in data entry operators.

Source: Bureau of Labor Statistics

HIRE from UPDATE/3

discipline, personnel experts and DP managers are less inclined to rely on such advertising. Arthur Simonian, director of information systems for Pratt & Whitney Aircraft Group in East Hartford, Conn., said, "We don't believe this is the way to get high-quality people in this business."

No single method has emerged as a sure way for recruiters to find the personnel they need. Organizations have implemented an array of hiring strategies that fill specific needs.

The search for a top-level MIS manager, for example, will take on a vastly different appearance from the search for a dozen entry-level programmers. And in an environment in which demand outweighs supply, employers find themselves in a tenuous position requiring creative, strategic thinking.

On campus

College students are as aware of trends in the "help wanted" pages as anyone, which helps explain the rush for computer science degrees on the nation's campuses. At MIT, in fact, the computer science department is overstocked, according to Robert K. Weatherall, director of career services and preprofessional advising.

"It's becoming more and more obvious that data is playing an immensely influential role in organizations," Weatherall said. "Students here are looking for creative opportunities to shape the way a corporation works. They want to have an impact. They look at someone like John Reed [the new chairman of Citicorp], who rose through the MIS ranks, and dream of similar paths."

Despite the plethora of data institutes and six-month crash courses in programming, recruiters remain committed to college graduates as the No. 1 source of entry-level help.

Pratt & Whitney's Simonian pointed out that the supply lines of recruits "are critical to us." In that vein, his group has worked with personnel to package a "first class" recruiting program that blankets 30 colleges in the Northeast and several others around the rest of the country. "Our predominant hiring source is the college campus," he said.

According to Simonian, the key to success in college recruiting has been the practice of assigning DP staff members and managers to visit campuses themselves, either with a personnel representative or alone. These DP-to-college relationships, he said, are not simply one-time visits but formal, ongoing commitments.

"In this way, we keep the school abreast of the kind of work we are doing, which in many cases is leading edge or very advanced work. The students are very interested in that," Simonian said.

Though he was hesitant to single out any particular university as a resource, Simonian pointed out that geographical location is a key factor.

"Georgia Tech may be a wonderful school but not for recruiting in the Northeast," he said. In fact, Pratt & Whitney recently opened a plant in Columbus, Ga., and for two years beforehand, company recruiters visited campuses in Georgia and Florida sowing the seeds for future hiring.

"Finding the right people is tough," Simonian admit-

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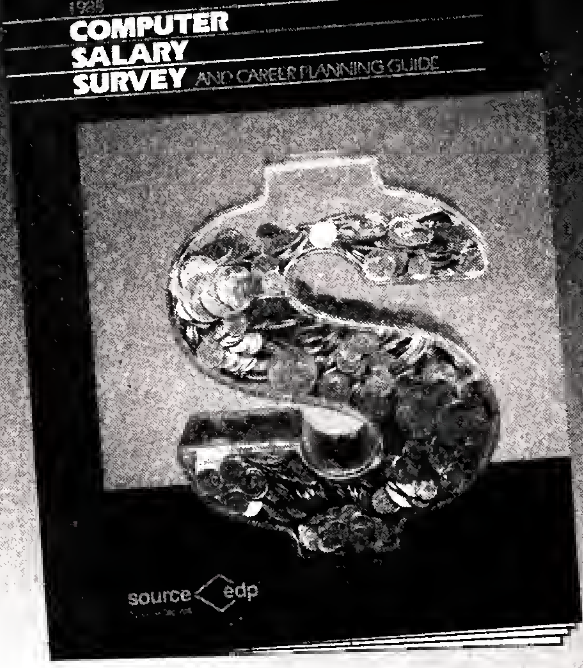

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Stratford	203/375-7240
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Jacksonville	904/356-1820
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Orlando	305/282-9455
Tampa	813/251-3215
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Atlanta/North	404/953-0200
Atlanta/Prmtr.400	404/255-2045
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Chicago/W. Loop	312/346-1280
Oak Brook	312/986-0422
Peoria	309/673-0274
Rolling Meadows	312/392-0244
Indiana	
Fort Wayne	219/432-7333
Indianapolis	317/631-2900
Iowa	
Des Moines	515/243-0191
Kansas	
Overland Park	913/888-8885
Wichita	316/688-1621
Kentucky	
Louisville	502/581-9900
Louisiana	
Baton Rouge	504/924-7183
New Orleans	504/561-6000
Shreveport	318/222-6188
Maryland	
Baltimore	301/727-4050
Columbia	301/730-6833
Greenbelt	301/441-8700
Rockville	301/258-8800
Towson	301/321-7044
Massachusetts	
Boston	617/482-7613
Burlington	617/273-5160
Springfield	413/739-4083
Wellesley	617/237-3120
Michigan	
Detroit	313/259-7607
Grand Rapids	616/459-6539
Lansing	517/484-4561
Southfield	313/352-6520
Troy	313/362-0070
Minnesota	
Minneapolis	
West	612/544-3600
Downtown	612/332-6460
St. Paul	612/227-6100
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New York	
Albany	518/482-2035
Buffalo	716/835-9630
New York City	
Grand Central	212/557-8611
Penn Station	212/736-7445
Wall Street	212/962-8000
Rochester	716/263-2670
Syosset, L.I.	516/364-0900
Syracuse	315/422-2411
White Plains	914/694-4400
North Carolina	
Charlotte	704/552-6577
Greensboro	919/379-1155
Raleigh	919/847-7605
Winston-Salem	919/724-0630
Ohio	
Akron	216/535-1150
Cincinnati	513/769-5080
Cleveland	216/771-2070
Columbus	614/224-0660
Dayton	513/461-4660
Toledo	419/242-2601
Oklahoma	
Oklahoma City	405/722-7410
Tulsa	918/599-7700
Oregon	
Portland	503/223-6160
Pennsylvania	
Harrisburg	717/233-8066
King of Prussia	215/265-7250
Philadelphia	215/665-1717
Pittsburgh	412/261-6540
Rhode Island	
Providence	401/751-0065
South Carolina	
Columbia	803/256-7446
Greenville	803/271-7044
Tennessee	
Chattanooga	615/265-8890
Memphis	901/525-0743
Nashville	615/256-0625
Texas	
Austin	512/479-0720
Dallas	
Central	214/954-1100
North	214/387-1600
El Paso	915/532-6316
Fort Worth	817/338-9300
Houston	
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San Antonio	512/342-9898
Utah	
Salt Lake City	801/966-3900
Virginia	
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Spokane	509/838-7877
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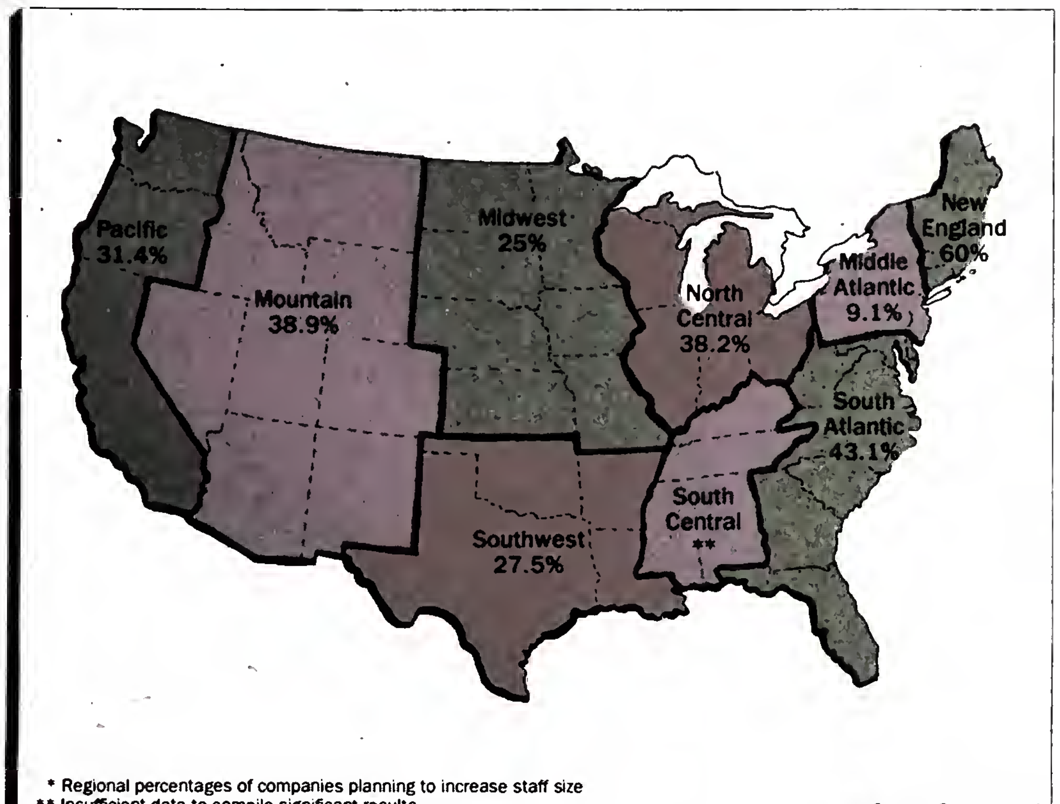
ted. "Given the fact that we have a well-organized program, we do it successfully. Without it, recruiting would be very difficult."

Ironically, as the computer science and electrical engineering departments have filled to overflowing, the profile for success in DP and MIS has shifted. According to Michael Lawson, director of the master's program in MIS at Boston University's School of Management, "In talking with business leaders and other academics, there seemed to be an increasing need for people who had both the technical information systems skills and managerial skills."

In the past two or three years, universities have begun to respond to this need by offering increased numbers of MIS courses within MBA programs. IBM, in fact, acknowledged this need by recently awarding $27 million in cash and equipment to 13 universities in order to help improve graduate instruction and research in MIS.

At Boston University, Lawson has taken it one step further and set up a graduate degree program specifically for MIS. Just finishing its second full year, the program has been enthusiastically received both by corporations, which have readily hired its graduates, and students, who recognize "a large and improving career path."

1985 HIRING PROJECTIONS FOR DP STAFFS*



* Regional percentages of companies planning to increase staff size
** Insufficient data to compile significant results

Source: Compusearch

The one-year program provides technical information geared specifically to solving managerial problems. Students are required to form four-person work teams, which are assigned to Boston-area companies for seven-month internships. These students work on an information systems project set up by the company. "They are part of a real systems problem," Lawson said. "It gives them the flavor of how a corporation really behaves."

As the Boston University program grows, demand for graduates increases. Lawson has spotted no particular regional trends in recruiting; students are finding positions across the country and even internationally. He has discovered that corporate recruiters are looking for a mixed bag of talent.

"One of the problems is that everyone has a different notion of what MIS means to them," he explained. "Many recruiters, when they say 'information systems,' are really looking for programmers."

While admitting that there is a continuing high demand for programmers, Lawson described his program as addressing the next level: systems analysts or people who can analyze a business problem and work with both functional managers and technical managers to build a workable system.

"One of the big frustrations out there is that the technology environment is changing so rapidly that it is very difficult to get a handle on things. There are fewer and fewer people who know what is really going on," Lawson said. "The other major frustration is the need to integrate the systems people with the rest of the organization. MIS is becoming an integral part of all functions of a business. For a group that has traditionally operated in a stand-alone environment, it can be a difficult transition."

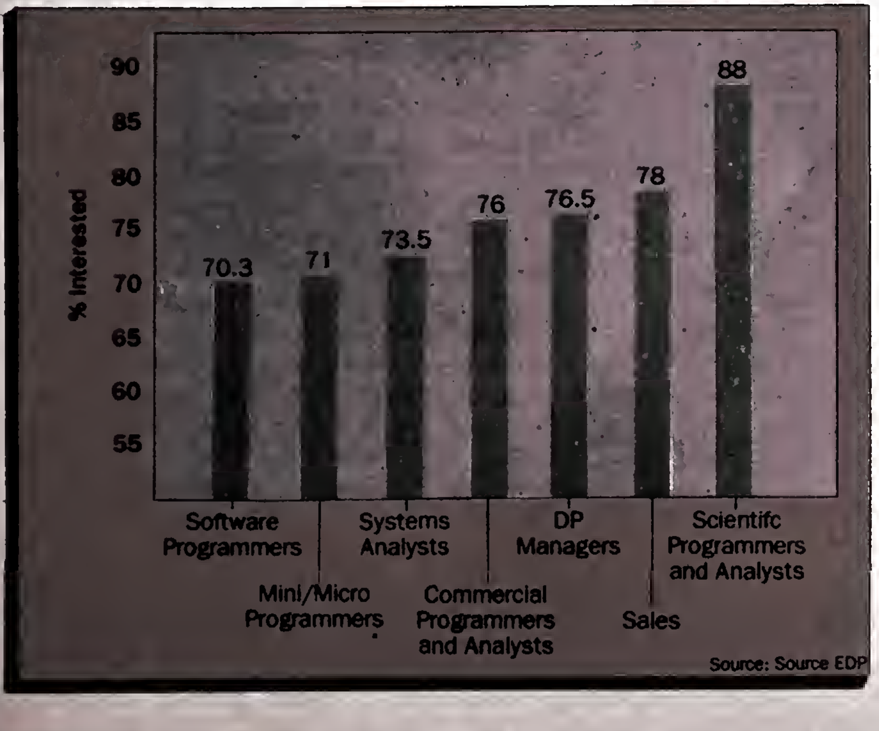
It is clear that the profile for graduates has changed dramatically. Companies are opting for a more diverse educational background than computer science and in many cases would prefer accounting, finance or engineering majors with some computer experience over the pure computer science major. "The bottom line we look for is high quality," Simonian said. "If a student is a liberal arts major but can display high quality, we'll take him."

Computer training institutes

The television and radio airwaves are choked with ads for local six- to 12-month courses that "could quite possibly change your life." Programming courses, in fact, have produced a flood of entry-level people who have found placement in large DP shops.

Though this type of program generally has acquired a good reputation with the industry, the drawback for many of the students is that they graduate from these institutes without college degrees and immediately face a dead-end career path. Without a college degree, growth beyond entry level is extremely limited.

DP PROFESSIONALS INTERESTED IN EXPLORING NEW COMPUTER JOBS



Source: Source EDP

Some institutes have addressed this problem by requiring college degrees before acceptance. The Cambridge Institute for Computer Programming (CICP), an intensive six-month program in Boston, is geared specifically to professionals seeking career changes. CICP supplies graduates to many Boston-area companies, such as Prime Computer, Inc.; Cullinet Software, Inc.; Fidelity Management and Research Corp.; John Hancock Mutual Life Insurance Co.; and New England Mutual Life Insurance Co.

According to Ted Scholl, vice-president of placement for CICP, 80% of the current class will find employment within 30 days of graduation.

"Our students tend to be more mature, in their late 20s or early 30s, and want a career change into DP," Scholl said. "Once they get into a company, they often will continue their education, perhaps going for an MBA with the company's support."

As Scholl pointed out, the requirements for programmers simply have changed in the past five years. Back then, he explained, there was such a demand that "anyone who could spell the word 'programmer' got hired." Today, there is a need for programmers with greater verbal and communications skills. The former teachers and liberal arts majors going through the training programs bring together the two needed disciplines.

The need for programmers remains strong, especially on the East and West coasts, Scholl said. Hardware ultimately dictates the market. For example, there is now a significant shortage of qualified IBM System/38 programmers, he said.

Though CICP graduates averaged starting salaries of just below $20,000 (compared with the low $30,000 range for college graduates with advanced degrees in MIS), most start in the mid-20s and have wide open paths for growth, Scholl pointed out.

"The short programs have been excellent for us," said Tim Billingsley, an employment interviewer with John Hancock. "The graduates are better trained than in universities. Our ideal candidate is someone with a college degree and a certificate from one of these programs. We just hired 20 people from CICP."

For some corporations, especially computer hardware and software makers, it has been expedient to forego searching for the perfect candidate and bring in generic computer science graduates for intensive in-house training programs. Doing so has a tendency, recruiters agreed, to produce increased loyalty to the organization as well as to create the model employee — one who was trained and molded not only in the particular job's function but in the corporate culture as well.

'OK, we want a four-year no-cut with a $250,000 signing bonus and a Trans Am fully loaded.'

In-house training has its drawbacks, however. Though training can be costly, a more crucial issue is time. It takes months for extensive or even basic training, and that can create problems for a DP department that needed help yesterday. In addition, the question of who does the training and how much input that person or group has in the hiring must be answered.

According to a recent Auerbach Publishers, Inc. report by Bruce Winrow on entry-level hiring, if an organization has a formal in-house training department, that department "must establish its role in the hiring process, and senior management must demonstrate its support of that role." Without input in the hiring process, the training department may face a no-win situation.

"Even when the training department must train less-than-ideal candidates, the trainers are held responsible for the new employee's performance. If the training department is judged by the perfor-

See **HIRE** UPDATE/6

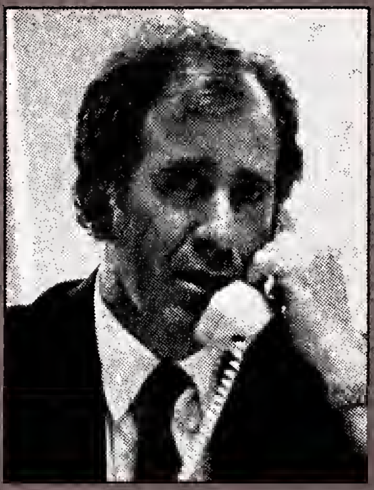
Update

A day in the life of a corporate headhunter

By Glenn Rifkin
Update Editor

It is early afternoon on a rainy April Monday and Jay Gaines is already tired and harried. He hasn't had time for lunch, and his next appointment is waiting. There is a list of phone calls to be returned as Gaines lifts the receiver, his back to the Manhattan drizzle.

Gaines is president of his own New York-based executive search firm, Jay Gaines & Co., which specializes in finding senior-level ($100,000 plus) data processing and MIS executives for the financial services industry. He and his associates occupy a small suite of offices on Madison Avenue, and it is behind the desk in his tiny corner office that Gaines spends most of the day.


Gaines

Executive recruiters don't like the term "headhunter" because of the images it conjures up. Recruiters, for example, don't lurk outside corporate headquarters, collars turned up, waiting to pounce on unsuspecting executives. Their days, in fact, are spent mostly on the telephone, calling prospects, references, resources and clients.

Though they have facilitated the departure of key executives and have often been dubbed "corporate raiders," executive recruiters are held in high esteem by their clients. A superlative recruiter can mean the difference between filling a high-level position with the right person or the wrong one.

Gaines has been busy this year. There is a constant need for top-level DP professionals, and the search for and recruitment of such a valuable commodity can take months. He recently placed a former IBM employee with a major investment bank with a mandate both to manage the software facility and prepare the launching of a profit center. Other recent placements include the head of the data center at a top-tier investment bank and the director of treasury systems and operations for a major bank in Boston.

At the very senior levels in DP and MIS, Gaines explained, searches take a long time simply because of the volatility of the profession. "There is continual movement and need," he noted. "You need to be more aggressive at that level."

Not unlike other executive search firms, Jay Gaines receives a percentage (approximately 35%) of the first year's cash compensation for the placement. While 90% of his placements are above the $100,000 range, his firm handles between five and seven big-ticket DP searches each year that fall into the $200,000 to $500,000 range.

Like a good detective, Gaines has a carefully devised game plan for finding and recruiting a senior-level technical person. Before he can do any looking, he must establish a strong and open relationship with the client organization to determine the profile of the desired placement. After that, the first step is to define the target field, he explained. Is the target position defined by the technology and functionality or by the company and industry?

That determined, Gaines turns to an extensive computerized data base of contacts in the field and begins the arduous task of canvasing what he calls "the leading experts." Included here are journalists or writers who closely follow the industry, academics, consultants, relevant users groups and professional societies.

Once he taps this grapevine of sources, Gaines must quickly review his acquired list of potential candidates and begin to contact them. Highly placed DP executives are well aware of their value in the market for the most part and tend to respond positively to the inducements of a recruiter. It is at the intermediate levels — the $75,000 to $100,000 range — where those in hot disciplines receive countless overtures from recruit-

See **HUNT UPDATE/24**

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SoftFair '85 is sponsored by Software Career Link serving equal opportunity employers.

HIRE from UPDATE/5

mance of its trainees, the training manager should have some control over the quality of the candidates," Winrow said.

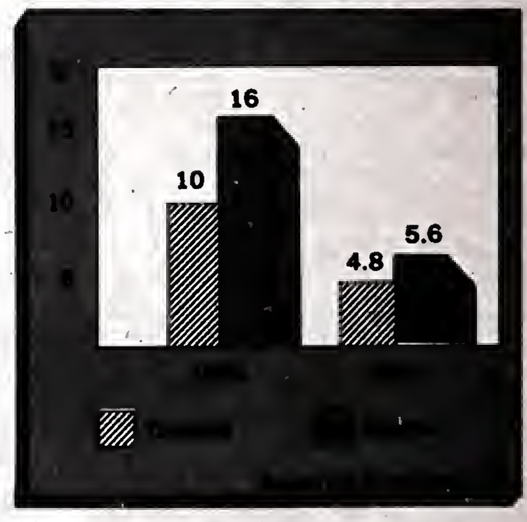
Despite the drawbacks, recruiting inexperienced entry-level people continues to offer a positive alternative for many organizations.

Management Science America, Inc. (MSA) in Atlanta, a leading software manufacturer, has been staffing its pool of software developers since 1979 with recent college graduates who are then entered into an intensive six-month training program. This year, according to Ken Millen, MSA's vice-president of personnel, the company has hired 150 students from 50 campuses to enter the program. MSA has hired more than 350 software developers in this fashion — about one-third of its employees — and the turnover rate among these employees is half of the company rate.

"We feel that these will be the key people in the company in five to seven years," Millen said. "It's an investment in the future."

At the Bank of America in San Francisco, the DP department, which numbers between 5,000 and 6,000 people, averages 400 openings during any given week, according to Gary Damiano, senior staffing specialist. Though many of those positions are for traditional Cobol programmers, the bank needs professionals with experience in the high-volume transaction utility called airlines control package/transaction processing function (ACP/TPF).

GROWTH AND TURNOVER IN MIS



That technology, which until recently was relegated to the airline, hotel and car rental industries, is spreading to banks and financial services organizations, creating a huge demand for skilled people. Unfortunately, there are only about 3,000 technicians in the world with ACP/TPF expertise, Damiano said, and those who know it are demanding high salaries. To solve this problem, Bank of America is recruiting and training recent graduates in-house.

"It just makes sense to grow our own," Damiano said.

Update

The rapidly changing demands of high technology often do not afford corporations the time or luxury of bringing in and training needed DP personnel. According to Billingsley, the competitive nature of the business forces companies to forego in-house training for every position.

"Many companies have to stay at the leading edge, and they are willing to pay for it," he stated.

Finding experienced DP personnel with specific knowledge of particular systems is difficult and frustrating. Corporations have turned to executive search firms, in-house promotion and referrals and job fairs to enhance newspaper and radio advertising.

Lawson

According to Christine Suarez, a consultant programmer in Boulder, Colo., companies looking for the "perfect fit" of hardware or software experience are often forced to "bite the bullet and wait." In the Boulder area, she pointed out, there has been a recent and unusual glut of DP professionals because of layoffs at major employers like Storage Technology Corp.

"DP opportunities in Colorado have shifted," Suarez said. "They used to be dynamic, but there hasn't been any new development in the last couple of years."

The result, she said, is that companies are willing to wait and look longer for specific talents.

"Someone might have a good knowledge of the VS operating system but won't know CICS," she explained. "It's hard to find someone who has both, and it's tough to get the hard-core DP person to think about the people part of it — to hire someone with close enough skills who could adapt quickly."

Among the methods for finding potential experienced hires is the job fair or open house. Companies like Bank of America, with its 400 openings, find it both practical and expedient to hold open houses for prospective employees.

"We used to go strictly through agencies and advertising, but we're changing that," said Bank of America's Damiano. "We spent $2.5 million last year on agency fees, and we're not going to do that again. We can hold two open houses per year for $40,000 each and end up with 20 to 30 hires per open house."

For an organization with a large number of open positions, an open house provides an excellent setting to match prospective candidates with the perfect job.

"We have 20 different units within the bank looking for different technologies," Damiano said. "The open house allows the candidate to come in and talk to the hiring managers. We do resume tracking and retrieval on all candidates to make sure that they are exposed to all the positions in which they might fit."

For companies with smaller scale needs than Bank of America, professional job fairs, in which dozens of local organizations set up booths, are increasingly popular.

According to David M. Callahan, head of Software Ca-

See **HIRE** UPDATE/10

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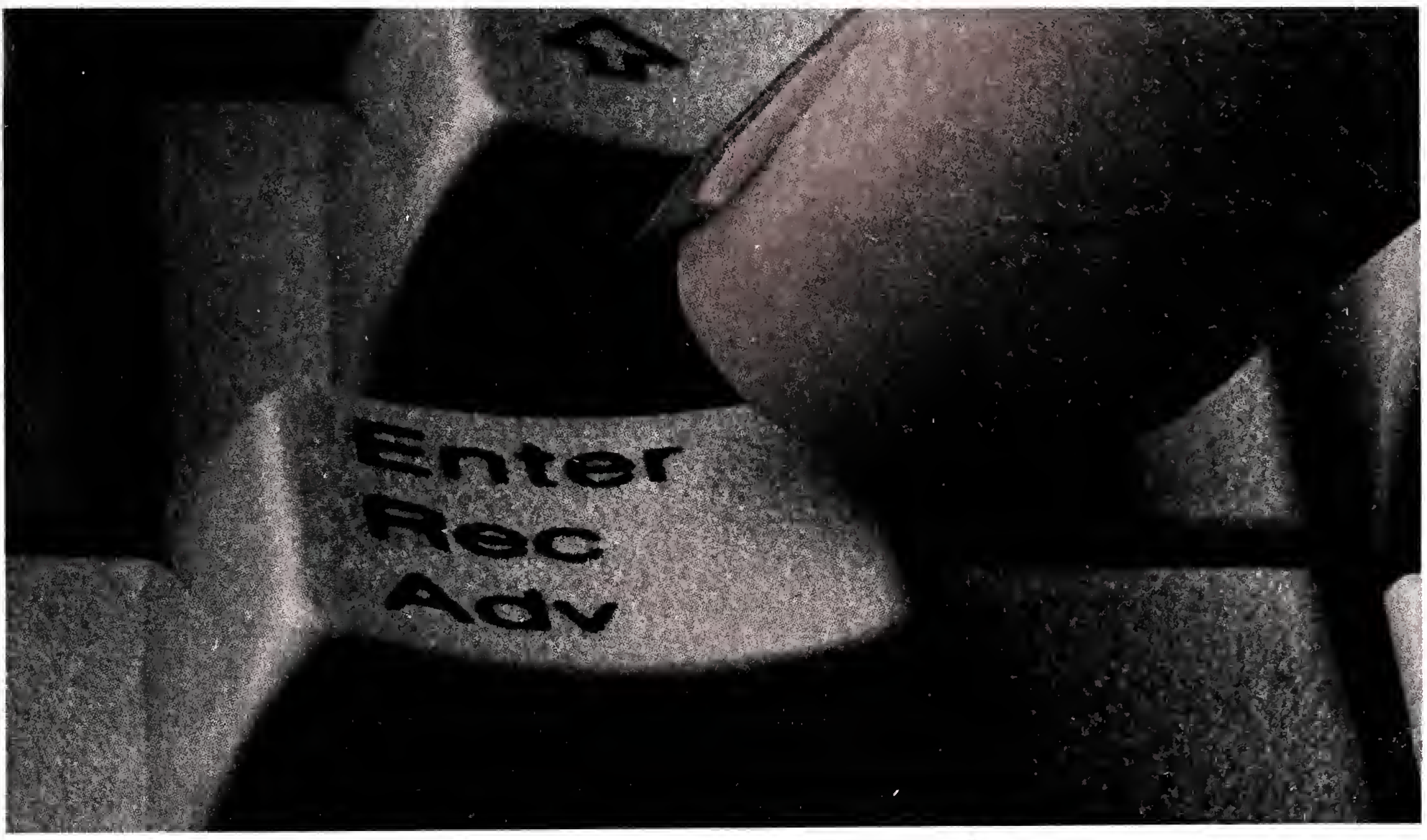

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Finders, keepers

Though their disciplines are quite different, Robert Half and John Diebold have a few things in common. They both have, for example, several decades of experience in their respective fields, and each is sought after by the powerful and influential for advice and consultation.

In fact, both men have founded and fostered highly successful businesses that have become known and respected in this country and around the world. Though each has stepped back of late to package his insight in book form, both Half and Diebold continue to have a global perspective on their areas of expertise.

Half began his recruitment business with one office in New York in 1948. A certified public accountant, he saw early on the value of a professional recruiting firm that specialized in accounting. As his business thrived, he started to franchise offices and began to recruit heavily in the DP field. Today, as president of Robert Half International, Inc., he oversees 90 offices worldwide. He is the author of the best-selling book *The Robert Half Way to Get Hired in Today's Job Market* and the just-released *Robert Half On Hiring.*

Diebold is an internationally acknowledged leader in the fields of management and technology. He is also chairman and founder of the Diebold Group, Inc., a consulting firm that he established in 1954. Diebold gained international recognition with the publication of his book *Automation* in 1952 when he was just 26. For more than 30 years he has consulted with both industry and world leaders on computers and automation. Diebold's *Making the Future Work* was recently published by Simon & Schuster.

Computerworld Update Editor Glenn Rifkin met with Half at his Palm Beach, Fla., home to gain insight into ways to find quality DP and MIS professionals and with Diebold in his New York office on ways to keep them.

INTERVIEWS

What are some of the issues involved in DP hiring as opposed to general business hiring?
Half: DP is different. It has to do with the fact that DP is a young profession compared with law, accounting, medicine or engineering. And since the profession is very young, it employs mostly young people. Older people didn't get the basic training in school, so it's harder for the industry to absorb older people. However, the fact that there is a youth generation in DP lends itself to very high turnover. The young are more impetuous, quicker to make a change.

If DP shops are looking for stability, they should try to train older people, and they would not get that rapid turnover. Raise the age level, do something about it. Every time you walk into the DP department, you see a different face. It's very disturbing, very hard to get anything done.

How do you get the older people?
Half: The same way you get the younger people. It's a little harder, but they'll want the jobs more. You may have to do training, but you have to do training anyway. You can't get a programmer who can fit into an operation right out of a programming school. Most of the schools aren't all that good, so it's up to the company to train the individual.

If you get a person, say 40 or 50 years old, and train him or her, you've got someone who is more likely to stay. I'm not suggesting you don't hire younger people, but you need that balance. The balance doesn't exist [in DP]. It exists in all other professions but not in DP to a great extent.

Do you have a profile of the perfect DP employee?
Half: No, because it wouldn't do us any good. The perfect person for you would be completely different than for the company across the street. What does a profile mean? Nothing. What does a company want? Whatever they want, they're right. If we think they are wrong, we'll tell them. But they may be right, and we could be wrong.

Who does the hiring in DP?
Half: In hiring, in almost all cases — 95% to 100% — personnel does not do the hiring. They do the selecting. The DP manager does the hiring. And the person doing the hiring often absolutely wings it. They have no particular knowledge of personnel problems. They may not even be acquainted with the laws of the land having to do with [hiring] discrimination.

The DP candidate may not have a flamboyant personality, and the interview may not reveal anything other than that the person is technically competent. Is that enough?
Half: I developed a form called Hire. You rate the person's education, experience and other factors according to a predetermined standard. I rate innate ability and willingness to do the job as more important than anything else.

What I've done is given tremendous weight to those two factors, so that if a person rates well on education and experience but on willingness and innate ability rates poorly, he probably won't get the job.

'If you ask individuals what motivates them, chances are, most won't say money. But wave some bucks, and chances are they're going to change.'

Robert Half

That's a tough thing to catch in a short interview.
Half: Very tough. But that's the way, when you can do it, that you get really good people.

You feel that the person doing the hiring in DP is not qualified to handle that chore?
Half: He or she is full of prejudices — not race, religion or color — but other things, like size or height or a personality trait — flamboyant, conservative. And that same person on the top of that pyramid doing the hiring is winging it, and he is often wrong. And the main reason is that he is hiring someone too strong who immediately becomes unhappy.

Where are the best places to find good DP people — universities, computer schools, other DP shops?
Half: It depends on what we are looking for. All those places can be the best. If you are looking for a beginner, you should look in the environments you mentioned. If you are looking for heavy experience, it's got to come out of installations just like yours. There's not much point in hiring people to do DP at a higher level who don't know the first thing about your languages or your equipment.

Is that a major criterion for searchers — that people know the hardware or software they have?
Half: Yes, but they have to understand that there is some hardware and software closely enough related.

If you get too specific, you are dealing with such a narrow market that the probability of getting the right person is remote. Hopefully, you'd find if you had an IBM installation that certain Burroughs Corp. equipment might be close enough that the person working on Burroughs [machines] might move right in without too much training. Better to get the good person and train a little than just get someone who will be here today and gone tomorrow.

How do you counsel companies in the ways to look for people?
Half: We try to highlight the similarities between systems that the company has and systems the candidate has worked on. We also point out that when the candidate got his last job, he had the same problem and was able to make an adjustment. That would be evidence. Hiring in DP is tough. I would not want to be a DP manager and show up every week saying 'Who is gone today?'

When someone with three to five years experience is seeking a job change, what are the key issues?
Half: I still believe that money is the most important factor. If you asked, a candidate wouldn't put money first because it's not the nice thing to say.

But I believe money is the greatest motivator. And a company can probably save money by paying slightly more than market rates. They'll save money because they'll have less turnover. That automatically takes care of it.

Benefits help lock employees in as well — good corporate benefits, profit sharing, pension plans, good insurance. If somebody says 'Charlie's wife is in the hospital, but it's not covered by our plan,' that upsets people.

At higher levels of DP management, is money also the chief motivator?
Half: That's still my belief, in spite of what the studies show. When someone is on an interview show, and is asked 'Why did you write the book?' did you ever hear anyone say 'money'? They wrote it for some other reason. It's the same way if you ask individuals what motivates them the most. Chances are, most won't say money first. It's not the right thing to do. But wave some bucks in front of them, and chances are they're going to change.

What is your outlook in this area over the next five to 10 years?
Half: As time goes on, you will see more stability in DP. If the turnover rate is 40%, it will drop to 20%. It will be more normal. There has to be a settling-down period. If nothing else, the young will be getting older; their mentality will change. They will be more willing to stay put. That may be the single biggest change we'll see in time. ■

Update

In your latest book, you mentioned that the systems that American businesses will need to select, develop and motivate managers are going to demand some rethinking. What do you mean by that and how will it impact DP and MIS shops?

Diebold: If you want to make an unduly simplistic but nonetheless realistic characterization of American personnel policies, it would be fair pay for essentially average work. It is a kind of homogenization. The problem with that is that it doesn't allow for the exceptional. And as you get into a world in which the differences can be enormous in terms of the value of an exceptional person as opposed to somebody who is simply good, you get into discrepancy problems. [These problems] are very tough to solve under our existing personnel philosophies.

In the computer field, talent is viewed as capital but is not recognized by the accountants and personnel policies. This view tends to catapult people out of large organizations into start-ups and small organizations where there is a big premium put on talent.

Do you have any suggestions about how to deal with this?

Diebold: One approach is to try to provide more freedom for particularly gifted people. One could put in some exceptional rewards and allow for flexibility. The technology itself offers some solution in a sense that individuals can live in a rural community if they want and have a much better chance of participating in a variety of businesses than was true a decade ago. I think that will be more true as we move ahead. But it is a difficult problem to solve.

As information technology changes the terms of competition in more and more industries, one of the problems that we are being asked to focus on is: How does one bring together the knowledge of information technology computers and communications and use them most effectively? How do you bring that together with an understanding of the markets and of the business itself? If the technology allows you to have a completely different approach to what you sell, then you can't reasonably expect that that's going to be achieved by people who are oriented primarily toward a staff support function.

Yet data processing people tend to be more loyal to their profession than they are to the firm in which they are working because, in many cases, they are so isolated from the business itself.

Diebold: The premium now is much more on people who genuinely understand the nature of the industry they are in and how the industry will change.

As an organization as a whole, not just as an MIS organization, you need to find ways of getting much more of an entrepreneurial view of the business in the direction of the MIS department.

Isn't that somewhat idealistic, though, when you are talking about the programming and entry-level operators? How can one reasonably hope to get those people more involved in business when the nature of the job doesn't lend itself to that at all?

Diebold: It is a question of the direction of it. The need to be innovative and creative and to carry on with this much broader global perspective that's now required still does not get rid of the routine jobs that they have come to do very well. So the way the MIS department measures itself has got to change because it is too easy to say that we are doing a job better than we did before in the traditional terms and not in the new terms.

'A survey we did indicated money was not the prime motivator at all. There is much more focus on someone getting a richer life out of their work.'

John Diebold

What are the key factors in motivating data processing people?

Diebold: One of the key things is to allow them to see that the work they do is actually being used and is helping to change things. One of the more effective means of motivating good people is to give them the opportunity to see that they are actually playing an important role in the organization. All too frequently there is not enough done in high management in terms of letting people really understand how important their role is.

It was clear from the responses to a survey we did a couple of years ago that it was not money that was the prime motivator at all. It was the sense of doing a responsible job, of being rewarded for assuming greater responsibility. There is much more focus on someone getting a richer life out of their work. Companies that put good human resource policies in place earlier on in the tight labor market are at an advantage now. And others that treated DP and MIS people as simply expense items must opt to change their work style and culture.

So recognition is really the key factor.

Diebold: Recognition, responsibility and the opportunity for creativity.

Are companies starting to realize this?

Diebold: Yes. For example, Traveler's Insurance Co. now has 9,000 personal computers, and they are increasing that number at a very high rate.

Everybody in the traditional part of the organization is aware that the MIS activity is a major factor in changing their competitiveness. That provides good psychic income to the MIS organization.

What about the opportunities outside of DP and MIS that were traditionally off limits?

Diebold: You see that the user departments have a lot of action going on and have a lot of need for MIS skill, some of which is being provided by training themselves, but some of which is being provided by support from MIS and some by actual personnel trades. You therefore have a change going on in the kind of personnel that you need in a large MIS operation.

The role of the MIS organization is changing dramatically and it is becoming more of a policy-setting organization, and the kind of people you need in the MIS operation are changing as a result.

With turnover being down, as our studies have shown, in some cases attrition is not taking care of the shift that is needed. Normally you would be able to orchestrate that kind of a change over a couple of years because people would leave of their own volition. That isn't always the case any longer.

So now you have to retrain those who are already there?

Diebold: Yes, and the question is whether people do or don't have an interest in doing the new tasks. There is a great premium on people going into MIS who, while in it, get a much broader business orientation and much more management orientation. The opportunities are enormous if they have that.

You mentioned that turnover is going down and yet job-hopping is still one of the major problems in this field.

Diebold: As I said, it is much less of a problem today than has been the case for a long time in the industry. The rates are really very far down.

To what do you attribute that?

Diebold: It's due to the fact that it's no longer a new industry. For a long time the computer field was really a very new industry growing at an explosive rate, and you had very few people who knew about it. It is very hard to imagine someone graduating from business school today without having a full understanding of computers. A typical business school graduate is likely to be a well-qualified user at this stage, so you have an enormous increase in supply. The supply of people who are computer literate is 20-odd million people. A few years ago, it was less than three million.

And yet, I am still hearing people reporting great shortages in DP talent.

Diebold: I am not saying that it has gone away completely. But it is very different type of problem.

What are the figures on turnover?

Diebold: In the '81 through '82 time frame, we were looking at a 15% to 20% attrition rate. In major metropolitan areas it was much higher. Now it is down to around 5%.

What that means is that, roughly every 18 months to two years, you could expect half the people in the department to be new. And now we look at that happening say, every five years. So, a lot of the people you have working for you now will still be with you in the future.

The climate, though, has changed, in the sense that more and more people are coming into the market. The number of new openings is less, so the opportunity for each job seeker to find something new has decreased, and there is, I think, a growing prejudice against job-hoppers in the field. Our clients in general have become a lot more selective about who they hire.

DP professionals have been typecast as lone wolf types with low social interaction. How will this person have to adapt to fit into the organization of the future?

Diebold: For exceptionally gifted people, there is a very real premium on creativity, and organizations are willing to tolerate a considerable amount of eccentricity for that. On the other hand, all the forces are moving toward a person having much more of an understanding of the human being in business.

Also, the mainstreaming of computer knowledge in society now is clearly going to change that perspective. There is a much larger pool of people who are going into computers. They are not the same self-selective bunch who, by temperament, like working alone.

For awhile, a lot of the more entrepreneurial and outgoing sorts really ended up going into more entrepreneurial companies. As the expansion that we have seen over the last five years with the electronic industry slows, we may see more of those innovative people going back into some of the corporations. ■

HIRE from UPDATE/7

reer Link, which sponsors 50 "Softfairs" in cities around the country, every company that participates averages 3½ hires per fair.

The format, Callahan explained, is advantageous to both the recruiter and job seeker. To gain entry to Softfair, a prospect must have at least two years' experience in some software-oriented discipline that is DP and/or MIS related. In surveys of attendees, the average experience is actually closer to eight years, Callahan said.

The fair setting allows recruiters to meet an average of two people per minute if they desire.

For attendees, the job fair offers an opportunity to shop around and see what is available without making dozens of phone calls or knocking on doors. It gives recruiters and prospects a chance to meet face-to-face rather than through the mail, Callahan stated.

"Most people feel this is a less threatening environment for job hunting," he said.

John Hancock's Billingsley, who must hire up to 100 entry-level people per year, is a firm believer in job fairs. "You find more good people at a job fair than through an agency, and it saves the company a lot of money as well," he declared.

The drawback to a fair, of course, is that dozens of corporations are on hand, and most are looking for the same qualifications. In the software arena, people with experience in data base management systems, IBM's IMS or data communications are in high demand, Billingsley said.

"We're competing with five or six groups here that are looking for exactly what we are," he acknowledged. "If an applicant is good, he or she could come out of a single fair with five or six offers."

Though job fairs and open houses have proved to be highly effective in volume hiring, the tools for filling specific experienced positions under tight deadlines are limited.

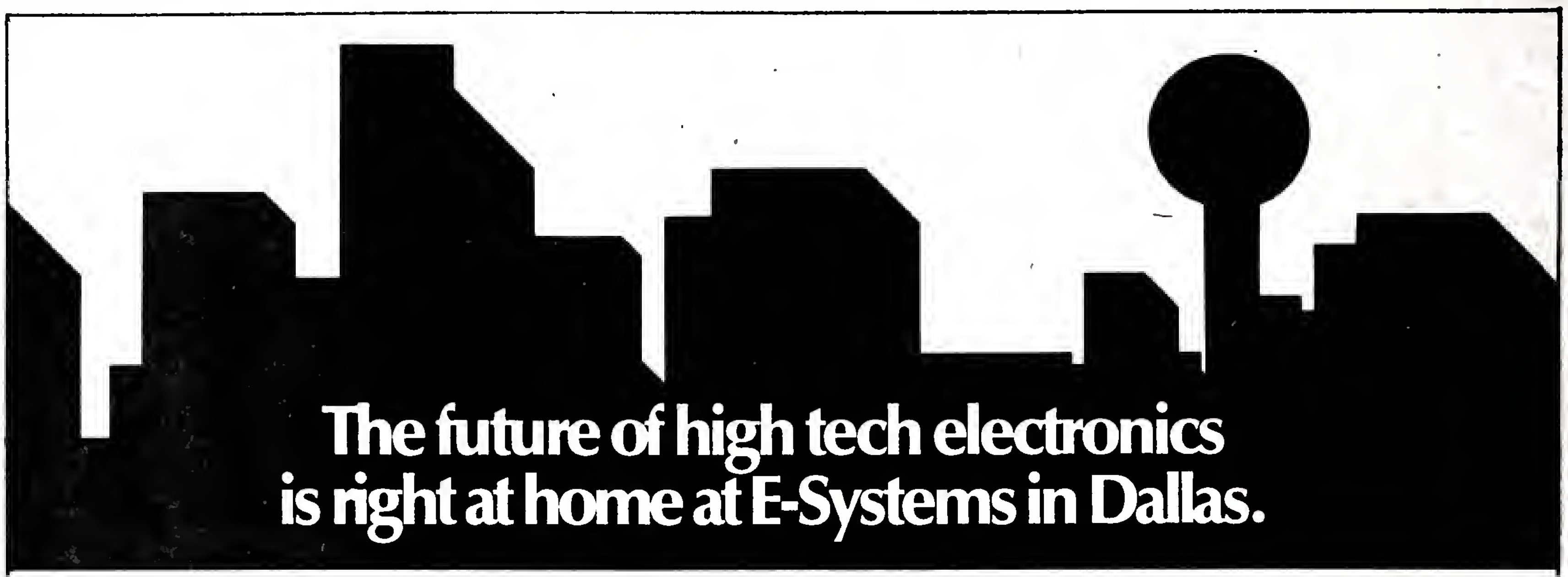
Some enlightened DP organizations have started formalized internal employee referral services, which have proven highly effective. DP personnel tend to have a strong sense of the employment market through professional associations and loyalty to the technology.

They often know of a friend or professional colleague seeking a job change long before anyone else, and recruiters agree that this resource is worth cultivating.

Experienced DP personnel, realizing the value of their services, have turned increasingly to professional placement firms to find new opportunities (see story Update/6). Corporations faced with the prospect of paying large sums to the search firm (generally a percentage of the candidate's salary) are reluctant to use placement agencies if it can be avoided.

Gillette's Hardy acknowledged that she uses agencies

See **HIRE** UPDATE/14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Update

Women: Outlook good but watch for pitfalls

By Connie Winkler
Special to CW

Many women who work with computers are "firsts" — they worked hard and diligently to become the first woman project leader, or the first woman to be named MIS director or the firm's first woman sales manager. But, midway into the 1980s and well into their careers, many of these women find themselves still facing career challenges — challenges unlike what they looked forward to or experienced in the past.

Although the picture is brighter for young women coming into data processing and for women with much-needed skills, many women who have been in data processing more than five years now find themselves wondering, "What happened?"

- A quality assurance department manager with a good job record is judged "too friendly" with users and told she does not fit in — although she can use the office for three months to conduct her job search.
- In California's Silicon Valley, the *San Jose Mercury* newspaper recently reported that of the 600 top-paid executives, most in electronics and computer-related industries, only eight are women.
- A woman has just been elected president of the New York Personal Computer Users Group, one of the most active users groups in the country. Yet, of the approximately 1,430 members, only 225 are women. The new president wants to do something about that.

What, in fact, is happening with women in DP today? Interviews with data processing women, men, recruiters and industry observers indicate that many forces are affecting women in data processing in 1985. New technologies have dramatically replaced the sure bets of the late 1970s, business understanding is more pivotal than ever and many DP professionals — both men and women — are finding their careers "topped out." Playing the career game today is much different than even two or three years ago — and certainly much different than five to seven years ago.

"What I've observed in banking," said Frances Quittel, a consultant to Crocker National Bank in San Francisco, "is that there are many women in DP at the vice-presidential level making $50,000 to $60,000. They're running departments, responsible for a system, an application or planning."

There are, however, few or no women at the senior vice-president or executive vice-president level. "There are very few women who make more than $60,000," Quittel, a former recruiter, said.

"There aren't many men beyond the $60,000 point either," quipped one consultant with more than 10 years experience in the industry. But men are more "apt to be chosen to run a division or run a group," Quittel added.

A female MIS director at a small company in New York, who asked not to be identified, now regrets going into data processing in the first place. Having started her data processing career with IBM in the early 1960s — as did many of today's senior computer women — she said she wishes she had gone into finance and headed off to Wall Street, "where the money is."

See **WOMEN** UPDATE/24

Winkler is a writer, lecturer and consultant on technology and careers. She is the author of The Computer Careers Handbook *and the forthcoming* High Technology Careers. *Winkler was formerly executive editor of* PC Magazine.

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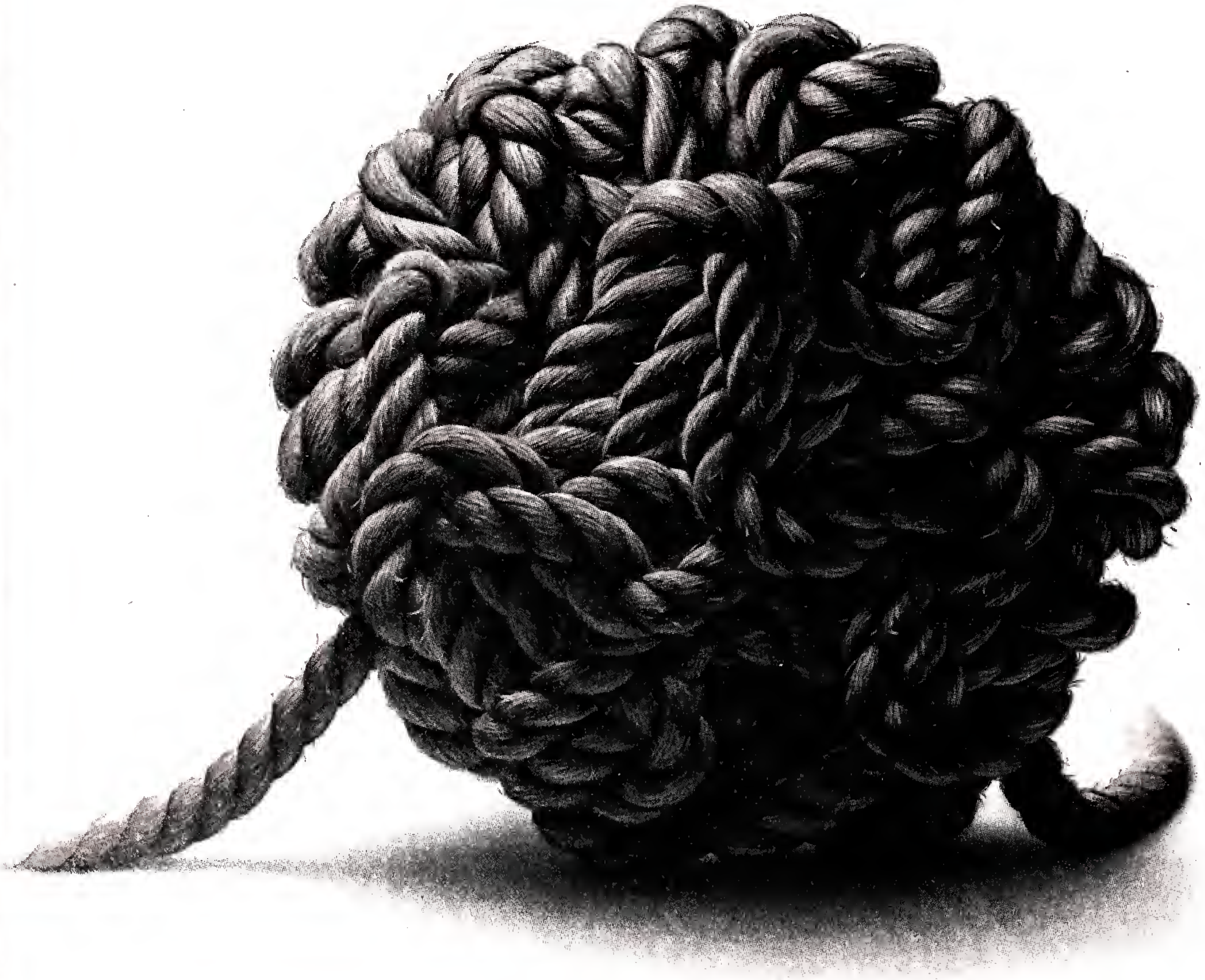

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WHERE FINE MINDS MANAGE INNOVATION.

HIRE from UPDATE/10

to fill a majority of open positions but tries to avoid that route for entry-level slots. Under a time crunch, however, a headhunter may, in fact, be the most effective recruiting tool outside of internal promotions, she said.

Looking in-house

Most corporations are required to seek internal candidates for open positions, and this method for filling both entry-level and upper-level spots is essential for both finding and retaining quality people.

At Eastern Airlines, Inc.'s Miami Computer Center, Joe Rodriguez, the center's director, works closely with Anthony Labay, an Eastern personnel manager, to fill needed positions. Though Labay uses a wide range of methods for recruitment, the company's policy is to promote from within when possible.

For entry-level positions, Eastern employees, particularly in the operations area, can make the switch into DP by passing an entry-level test. They are then given extensive on-the-job training.

Some corporations understand that the loss of a key technical person can devastate the DP organization, and so they institute formal succession planning programs.

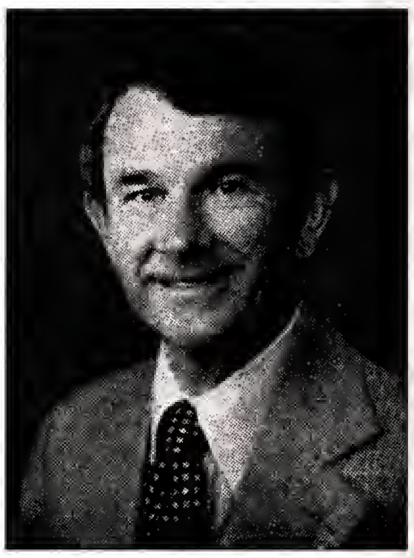
Succession planning can be as simple as designating successors to each management position, or it can encompass detailed career planning proposals and the ripple effect those will have on the entire organization.

Succession planning not only works as a logical and less disruptive means of replacing key personnel but is also a motivating tool for lower level employees anxious to know where their career path is heading.

Though hiring from within is a preferred method of finding DP staff, it has drawbacks. With the ever-changing face of technology, refusal to look outside will inevitably create a stagnant atmosphere.

"You need new blood, new experience coming in," said Eastern's Rodriguez. "Training someone in-house tends to make that person focus on just the particular system they are working on. Soon you find your overall expertise is dropping. So you need experienced people from the outside."

Finding the right people is only half the battle. Hiring them is the trick. Knowing they are in strong demand has created a buyers' market for DP and MIS professionals. A qualified computer professional might be courted by several offers. It will take more than a competitive salary to attract him.



Couger

Even corporate recruiters in need are quick to point out that they avoid job-hoppers. "I know the market is mobile," said Noreen P. Reilly, an employment representative with Shawmut Bank of Boston, "but I don't want someone who has had three jobs in two years."

As it becomes increasingly difficult to find both experience and stability, corporate DP and MIS shops are learning from both internal personnel and outside placement services what factors draw the best people.

The determining factors may well be the following:

- Geographic location.
- Nature of the work.
- Nature of the business.
- Chance for advancement.
- State of the technology.
- Corporate culture.

Recruiters said that large cities tend to be obvious magnets, and supply and demand in urban centers remains high. Programmer gluts have appeared in isolated cases, such as Houston, where problems in the local oil business have hurt many professions. But hiring on a regional basis continues to be strong (see chart Update/5).

The high-tech belts in Northern California, Massachusetts, Texas and North Carolina are also excellent spawning grounds for computer talent. But drawing that talent away to more remote areas takes both money and a combination of several of the above-stated characteristics.

Salary, most experts concurred, has to be competitive. Once that issue is addressed, the job itself is of greater influence. "When people work here, they know they are building skills that will make them very valuable," Simonian said.

Being at the leading edge of technology is also an essential recruiting tool. The major vendors like IBM, Digital Equipment Corp., Hewlett-Packard Co., Cullinet and others have little trouble attracting high-quality technical people who would rather help create the latest bells and whistles than maintain a five-year-old system.

Such high-tech industries as aerospace or electronics, which are utilizing the latest technologies, are also hotbeds for DP staff. And as technology begins to affect the Fortune 500 companies as never before, other conservative industries such as banking have changed.

"Five years ago, when banking was a regulated industry, it was the last place college graduates wanted to go," Bank of America's Damiano explained. "Now banking has changed dramatically and is as high-tech as any business in the country. If someone can come into Bank of America and make the system work, they can do it anywhere in the world. Our systems are immense, and that is a hell of a selling point."

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Update

Keeping the good ones

Finding high-quality DP and MIS staff is one (not-so-easy) thing. Keeping those same people happy, motivated and in-house is another. DP and MIS departments must cope with the reality that supply does not meet demand and that, coupled with a spate of complicating factors inherent to the profession, has made retention one tough task.

In a field where the turnover rate has reached 20% or higher for some organizations in recent years, the cause for alarm is real. Management has grown tired of peering into the DP shop on any given morning and seeing unfamiliar faces. With new interest in the issues surrounding retention of DP and MIS staffs, corporations have started bringing stability to these technical staffs, and evidence of this enlightenment is beginning to surface.

In a 1984 study called "MIS and Telecommunications Budgets and Key Indicators," the Diebold Group, Inc. found that turnover in MIS departments of major corporations had dropped to 5.6%, by far the lowest point in the five years that the study has been done.

According to J. Daniel Couger, professor of computer and management science at the University of Colorado, the Fortune 500 has seriously begun to address the issues surrounding motivation of the DP staff. In the past 10 years, he noted, managers have recognized that technology is not the sole answer to keeping people happy. "For the first time in our industry — and I've been in it for 25 years — managers seem to be more interested in the holistic approach, looking at behavorial issues as well as technical issues," Couger said.

Despite this upturn, much remains to be done. The often-heard comment that DP professionals have more loyalty to the profession than to their employers continues to ring true in many cases, and an increased effort is being focused on changing that.

Motivation value

Motivated employees are like diamonds: They are rare and in demand. Though it can't be quantified, the difference in productivity between a motivated and a complacent employee is dramatic, and countless studies and books have been written about better ways to turn on the help. According to the best-selling book *In Search of Excellence* by Thomas J. Peters and Robert H. Waterman Jr., "Researchers studying motivation find that the prime factor is simply the self-perception among motivated subjects that they are in fact doing well."

In DP, that self-perception is often difficult to attain. Data processing, for example, is often cited as the scapegoat for internal problems and has also been called unapproachable by the user community. If management accepts this, DP staff members can become frustrated with the company.

MAIN REASON FOR LOSS OF DP PERSONNEL*

Reason	Total %
Lack of advancement	16 - 32
Compensation	15 - 30
Other job opportunities	6 - 12
Challenges elsewhere	6 - 12
Changing environment	4 - 8
Location	3 - 6
Bad management, lack of planning	3 - 6
Competition	2 - 4

* Information from base of 50 DP respondents

Source: Burke Marketing Research

In a report for Auerbach Publishers, Inc. titled "Motivating DP Personnel," Frank Stanley of the Computer Task Group, Inc. wrote, "Using motivation techniques from the managerial level on down can significantly improve employee morale and self-image, which is reflected in their attitude and work. As a result, the department may be perceived more positively within the organization."

Among the key factors generally agreed upon as motivators for data processing and MIS staff are recognition, challenging work, growth paths, access to state-of-the-art technology, salary and communication. As Stanley pointed out, motivation can dramatically reduce employee attrition.

Why they leave

Just as salary is generally not the key factor in recruiting, it is also not the most important motivator for keeping employees. In DP and MIS, according to Couger, the most important motivator is unquestionably the work itself. Madeline Weiss, a Washington, D.C.-based management consultant, recalled a top systems analyst who turned down a lucrative job offer and said, "I've done that job. I wanted something different and new." An unchallenged employee is soon to be an ex-employee.

See **HIRE** UPDATE/16

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HIRE from UPDATE/15

Experts point to other reasons for turnover. It is up to management to pay close attention to the needs and desires of the individual, noted Glenn Young, vice-president of Walter Ulrich, Inc., a Houston consulting firm. Management must provide the proper tools to do the job. "Without the right tools, people get frustrated and then leave," Young said.

Pratt & Whitney's Simonian added, "The major reason you lose people is that your objectives are no longer compatible. That can take many forms. A person may simply not want to live in the area any longer, or there might be a personal problem."

Lifestyle changes, Simonian pointed out, are among the leading culprits behind attrition with the predominantly young population in many DP shops. "As life objectives take shape, there is usually a logical reason for someone to leave," Simonian said. "And we are happy to mutually part ways in that situation."

Unfortunately, not every parting is so harmonious. Executive search firms have little trouble enticing potential candidates, especially mid- and upper level employees, to consider switching jobs. Top salaries are attention getters, but there is often underlying discontent for that employee which, if addressed, could have warded off the headhunter.

"My feeling is that people basically hate change, and many won't leave a job just for money," said Barbara Durant, assistant vice-president of wholesale banking support at Manufacturers Hanover Trust Co. in New York. "More people leave when they are unhappy. You can't stop headhunters, but you can work hard to keep people happy."

Core job descriptions

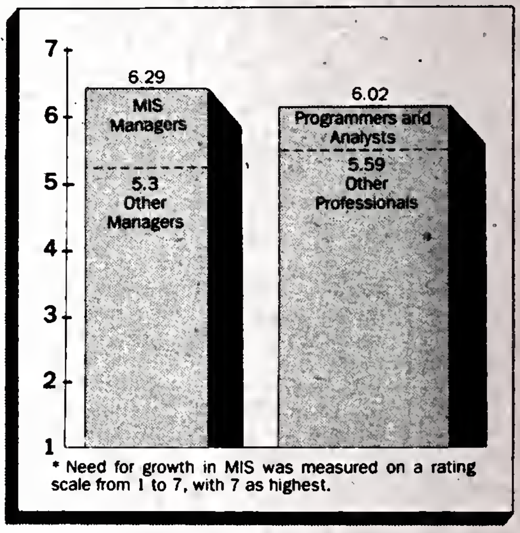
In 1978, Couger and his colleague at the University of Colorado, Robert J. Zawacki, released a major study on the motivation of analysts, programmers and operations personnel. The study extended the work of Frederick Herzberg, a pioneer in behavioral science in the workplace, to address the DP and MIS professions. Couger and Zawacki's research has continued since 1978 and has focused on several other key occupations within the profession, drawing on a data base of more than 10,000 DP and MIS employees.

Couger and Zawacki found that, not unlike the situation in any other occupation, the five core job dimensions are task significance — the impact of the work on others; skill variety — the degree of different talents required; autonomy — the freedom for the individual to determine job outcome; task identity — doing a job from beginning to end with a visible outcome; and feedback from the job. These factors, rather than salary, determined the contentedness and motivation of an employee.

The researchers discovered, however, that DP and MIS people had more acute needs in two particular areas than workers in other fields. The first area has been called growth needs strength and refers to the need for challenge and growth in a job. "Of the 500 occupations looked at previously, people in [the DP and MIS fields] have by far the highest need for growth in all job types," Couger stated.

The second area of note is called social needs strength and refers to interaction with fellow employees. "The need for social interaction is much less for people in our field," Couger said. "Many of the jobs in the field are the kind that can be done alone, and the profession has attracted people who work well alone."

NEED FOR GROWTH IN MIS*



* Need for growth in MIS was measured on a rating scale from 1 to 7, with 7 as highest.

By isolating these two characteristics, the study provides insight into some basic problems in retaining good DP people. "Most people need a sense of achievement, but it is more true in DP," Weiss explained. "It's [peculiar] to the breed. To grow professionally in this industry you have to learn new systems and keep abreast of rapid change. The DP person doesn't care what the environment is like — he'll work in the basement — but he wants continual challenge."

Providing a challenge for staff does not require bringing in the latest technological marvel, however. Fortune 500 companies generally don't have the inclination to purchase leading-edge toys simply to keep DP staff content. Instead, challenge and growth take other forms.

At Eastern Airlines' Miami headquarters, the computer center is responsible for a long list of dynamic areas of computing for the airline, including office automation, microcomputers, MIS and a host of applications development projects.

See HIRE UPDATE/18

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Management training can cut high rates of turnover

By Frank J. Stanley
Special to CW

Perhaps no individual within data processing has as much impact on the retention of good people as the DP manager. Ironically, the development of effective managers is usually ignored.

Missing from the managerial ranks of data processing are individuals who are suited to the role and individuals who are trained to carry out the role. In more cases than not, DP managers come from the ranks of the technical staff (programmers and analysts) and, at least initially, are little more than programmers and analysts with the title of manager.

While their understanding, acceptance and development in this role eventually occurs, it usually happens only through the efforts of that great teacher — experience. The unfortunate aspect of this type of management training, however, is the cost of the education. This cost in terms of stress, mental anguish, loss of personnel and actual dollars can be enormous and, as such, should be avoided if at all possible. While experience cannot and should not be avoided, better preparation of new managers to deal with those experiences will help to ensure better control of the outcomes and positive results. This can only be accomplished through effective management training.

Effective management training for data processing does not mean spending two days at a seminar nor does it consist of simply working alongside another manager for a week to learn the ropes. To be effective, training must consist of a series of educational encounters over a period of time that are specifically oriented toward the individual business and the skills that the manager must exercise.

An educational program has three purposes:

- It should assist in the selection of managers.
- It should provide for training in management skills.
- It should ensure continued reinforcement of those skills.

In addition, the program should provide feedback so that it can be self-correcting and continuously up to date.

The position of manager of systems or manager of programming is dramatically different from that of a systems analyst or programmer.

The differences are illustrated in the chart below, which lists various aspects of an individual's job as seen by a programmer/analyst as opposed to those same aspects as seen by a manager.

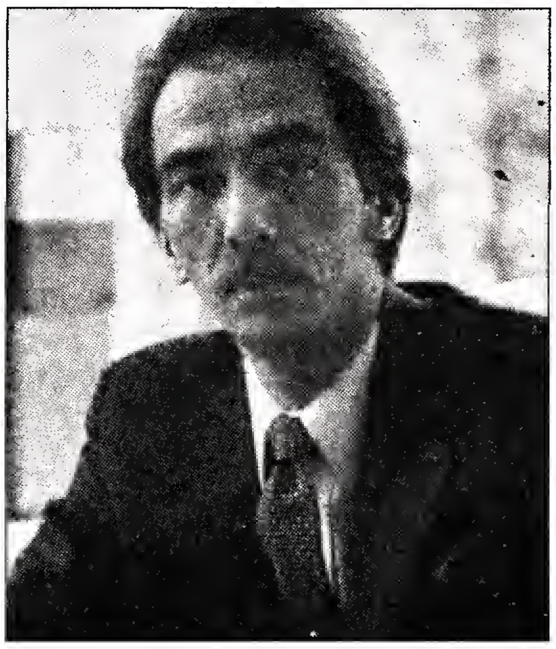
It is easy to see that major differences exist, and that many aspects of a manager's job are not necessarily skills that technical staff members have developed in the course of their careers. Perhaps the biggest and most difficult difference to overcome is that a manager is a facilitator not a doer. Managers are not measured by the output that they themselves produce but rather by the productive effort of the staff for which they are responsible.

Aspects of Job	Programmer/ Analyst View	Manager View
Functions	Programming/ analysis, design	Planning, organizing, coordinating, controlling
Responsibilities	Develop programs, systems	Manage people department, budget
Orientation	Specific tasks	Coordination of overall activity
Completion criteria	Deliverable	Varied and ongoing
Skills used	Technical/logical	Interpersonal — creative problem solving
Description	Doer	Facilitator
Organizational commitment	Not required	Necessary
Peers	Within data processing	Within the organization

Typically, the first time a crisis arises, a new manager solves the problem by digging in and doing the work himself. In the short run this produces the necessary results, but over the long term it does not provide the manager with the opportunity to learn to manage nor does it encourage the growth, achievement and motivation necessary for a staff to be effective.

Working in a new area of responsibility can be uncomfortable when an individual is given new duties without adequate training. The helping hand and familiarity that training provides can mean the difference between avoiding and dreading new duties and eagerly undertaking them.

Candidate selection is the first part of the training program and should be taken as seriously as the recruitment of employees. A management development program cannot be effective when applied to people without management potential. While there will always be a subjective aspect to this process, a certain degree of risk can be eliminated by developing selection criteria and a ranking method. The selection criteria should consist of qualities and attributes that are deemed important for the specific position within the specific organization and might include the following:


Stanley

- Knowledge of the job. Does the person know his current job well, and is he aware of how it fits into the larger picture?
- Past performance. Has the person demonstrated qualities in his current position that indicate an ability to handle new duties?
- Desire. Does the individual want to be a manager? A person who accepts the position of manager but has no real desire for it will never become a really exceptional manager.
- Personality traits. Does the individual display the personality traits that are desirable in managers and tend to indicate potential success? These traits can be measured with a variety of psychological tests that are extremely accurate. The difficulty lies in determining which traits are important indicators of success.

A method of measuring developing skills that is used successfully in some firms is an internship program. This requires potential managers to spend part of their time in training and management activities while retaining their technical responsibilities. This gives the organization an opportunity to measure how well an individual is making the transition. It also allows the employee to determine his own feelings about the position and to back out gracefully if he does not feel that his career lies in the management area.

As more and more people pass through management training, the selection criteria can be refined based upon the success of those involved. A personality profile can be developed from successful managers that will help provide a better match for future candidates.

The training program

If a firm is going to invest in its future managers and hopes to provide valuable, useful education, then a lot of care must go into the selection, development and scheduling of training sessions. The needs of each organization will vary somewhat due to the nature of its business, but some general rules and guidelines can be applied to most management development programs.

Business/administrative skills. A manager must know about the business that he is in; knowing Cobol, IMS and how to design systems may be a good background, but a manager's job extends beyond data processing and embraces the functions of the business.

It would be ludicrous to send an employee to an outside professional training session on performance evaluation or recruiting only to find that the policies advocated were at odds with the company's existing policies. Training sessions put on by in-house personnel are superior since they generally provide useful examples to which the potential manager can easily relate.

Interpersonal skills. There are a variety of managing skills essential to success that do not specifically relate to DP. These skills include the ability to communicate, listen, motivate, delegate, think creatively, solve problems and make decisions. In some respects, these are the most important managerial skills because these are people skills, and dealing with people is the essence of management. Because these skills are of general nature, training can be provided either in-house, if expertise exists, or at professional seminars. Outside training for these types of skills can be beneficial as valuable insights and fresh approaches can be learned.

Continue to reinforce. Education should not stop once a formal training course is completed. Rather than following a rigid curriculum, a trained manager should spend a certain amount of time advancing his management education.

Practice. No one should be expected to attend a comprehensive management course and then be able to perform effectively; much of what is presented in a lengthy course gets lost in the sheer volume of material. An effective format for training consists of a series of training sessions, each oriented toward a specific skill spread out over a period of time. Sessions should be intensive, interactive and include examples and role playing.

Technical training. To manage a DP staff effectively and to play a part in making crucial decisions, a manager must maintain some degree of proficiency in the technical arena. This usually is not a problem when someone is initially promoted, as they are likely coming from the technical ranks where their skills are sharp. But as time goes by and the hardware and software environment changes, a manager may find himself getting technically out of date.

A successful management training program is hard work. The results, however, are worth the effort. By ensuring that the correct people are selected and that they are aware of their roles and prepared for them, an organization is ensuring the success of both its managers and all the individuals who work for them. ■

Stanley is systems engineering manager for the Computer Task Group, Inc., a management consulting firm in Independence, Ohio.

HIRE from UPDATE/16

Addressing these issues, according to Eastern's Rodriguez, is what provides the challenge. "If you try to keep up with the latest technology today, you won't get any work done," he said. "We try to give people the opportunity to move internally. Say an applications programmer has his sights set on being a technical programmer; we try to be flexible in transferring people to keep them happy in what they are doing."

Cross-training in various technical disciplines can help avoid task or applications specialization in which an employee gets pigeonholed. Calling on a particular employee to repeat the same task continuously not only can lead to boredom but also can limit that person's scope of knowledge. As Stanley stated, "Cross-application work not only provides employees with fresh areas of interest but also provides valuable cross-training to safeguard the organization."

Corporate planners and managers are also discovering a more obvious route: get DP more involved in the business of the organization. DP and MIS personnel have long felt that their group was simply an add-on service wing of the business that could just as well provide its function to company A as to company B.

"It's up to the companies to work hard to make DP [employees a] part of the business and not just hired hands with a technical specialty," said Randy Nord, vice-president of Kurt Salman & Associates, a Princeton, N.J., consulting firm.

At Pratt & Whitney, a continuing effort is being made to do just that. According to Simonian, "We are here to produce high-quality, low-cost [airplane] engines on time. That is our product." The MIS group is as much a part of that enterprise as anyone is, he said, and its activities are measured in terms of how well it impacts on the company's product.

"It's amazing that people think they have to create phony leading-edge projects so they can fool around with the technology," Simonian said. "We don't do that here. We are dealing with applied technology, but it is in a real environment. It's incredible how much more stimulation comes from that than from a contrived situation."

Low social needs

The second characteristic that emerged from the Couger/Zawacki study — low social needs among DP and MIS professionals — has had an equally strong impact on retaining good people. As end-user computing spreads, the DP professional's role has changed, and the need for interactive grace has become acute. In addition, lack of good communication skills has become somewhat inbred in DP environments and has been the source of many attrition problems.

As Couger pointed out, managers and supervisors who came up through the ranks continue to have the same lone-wolf mentality as they did when they were programmers and analysts. Thus, they are less likely to spend time with their employees providing guidance and feedback, and, in turn, the employees are not inclined to knock on a supervisor's door to ask for it.

These same employees, however, with high growth needs strength, are goal-oriented and want very much to know about their progress. These conflicting needs and the resulting lack of communication between employee and manager lead to frustration and, often, resignation.

As Stanley noted, "recognition of effort makes employees feel that their work is important and worthwhile. *An employee will never mistake lack of criticism for recognition.*"

Recognition comes in many forms. A simple pat on the back or announcement of a job well done at a staff meeting — both just common-sense practices for enlightened managers — can work wonders. "Little things mean a whole lot," Nord said. "It's important to recognize what DP is contributing to the business."

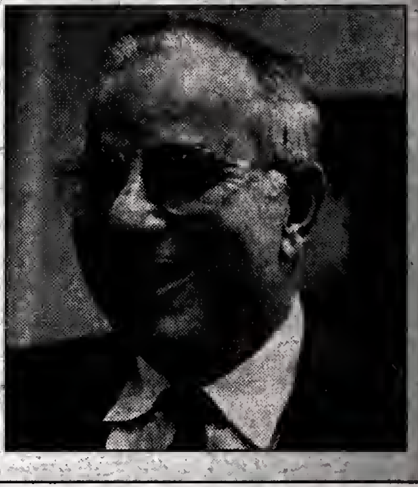
At Eastern Airlines, employees who do outstanding work are given free passes for flights. Cash bonuses, if available, are excellent motivators but have the drawback of instilling jealousy and discontent among co-workers.

Involving employees in joint planning for the organization instills a stronger commitment on the part of the employee to make those plans work. Giving employees more responsibility, stretching their capabilities and saying, "I know you can do it," provides extremely positive feed-

See **HIRE** UPDATE/20

'The major reason you lose people is that your objectives are no longer compatible. That can take many forms.'

— Arthur Simonian
Pratt & Whitney Aircraft Group



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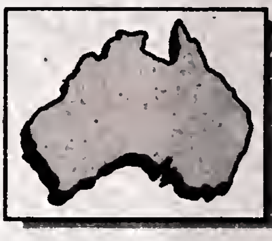

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MIS turnover: Manageable and not always undesirable

By John P. Murray
Special to CW

The managers charged with the development of the MIS staff must accept at least some of the responsibility for the high rates of turnover in the industry.

Given the plethora of opportunities available, people are constantly encouraged to consider positions in other organizations. When MIS management does not provide any evidence of a strong and continuing commitment to employee development, staff members are tacitly being encouraged to accept positions elsewhere.

There is more here than may be apparent. Often, those who do not leave tend to be less-than-stellar performers. These people are aware of the limited opportunities, but they lack the confidence, the ambition and the desire to move ahead, so they remain. Organizations that build a group of such employees cannot reasonably expect to make significant progress toward building a strong MIS function.

If this situation becomes sufficiently pronounced, it will build an environment within the department that resists change and growth. Because this group of employees will gain considerable power within the installation as a result of long service and intimate knowledge of many of the critical applications systems, they are able to thwart progress. Sometimes this is carried on as a conscious effort, sometimes not. Either way, it can create serious long-term problems for the department and ultimately for the organization.

Murray

The goal should not be to develop a "no turnover" policy. Some turnover is not only inevitable, it is desirable. One reason is that well-selected replacements can bring new ideas, approaches and experiences that can push the organization ahead. Turnover is necessary in order to combat the isolationist tendencies present in many DP/MIS departments.

There should be two goals where turnover is concerned. The first should be to develop an environment where turnover is maintained at a reasonable level (10% to 12% annually). The second should be to use turnover creatively both to open up new opportunities for those within the organization and to introduce new concepts. The thrust should be to avoid allowing turnover to control the department's performance.

Feeds on itself

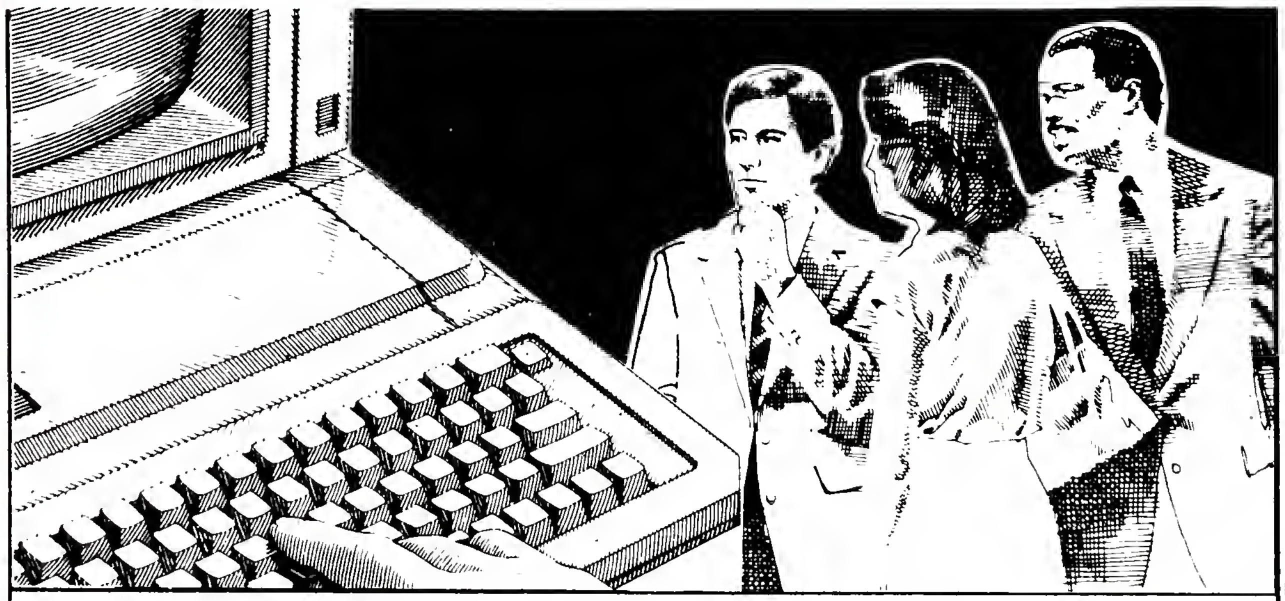
There is an additional aspect to the issue of turnover. Turnover feeds on itself, and turnover in excess of 12% to 15% per year can be a factor in causing the turnover rate to increase. In certain situations, the departure of some people will encourage others to follow. In fact, it is not at all unusual to find people who leave encouraging others to join them in their new organizations or to move on to somewhere else. If prospects for increased training, challenge and advancement are lacking in an organization, resisting such blandishments can become very difficult.

In addition, in high-turnover situations, that turnover can be exacerbated because those who remain fear that the loss of experienced people will force them to accept undesirable assignments. They may also fear facing very complex systems problems without being able to rely on the assistance of more knowledgeable people within the organization. Sometimes moving to a new organization becomes a very pragmatic issue for reasons other than the obvious ones of increased salary, promotion or new challenges.

It is not only possible, it is also practical to in-

See **LEAVE** UPDATE/23

Murray is director of management information systems for Rayovac Corp., Madison, Wis. and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*



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back and recognition of talent.

"If management creates an expectation of success for an employee, it is a very powerful tool," Weiss said.

> **'If management creates an expectation of success for an employee, it is a very powerful tool.'**
>
> — ***Madeline Weiss consultant***

For DP and MIS employees, another major frustration is lack of communication. Couger's study, in fact, indicated a universal feeling among DP professionals that their supervisors are poor in providing feedback on performance. The supervisors, in turn, were unaware that their staffs felt that way. "People love to be informed," Durant said. At United Technologies Corp., of which Pratt & Whitney is a part, all middle- and upper level managers are required to take specialized training programs for strengthening communication skills.

"People today want to be communicated with," Pratt & Whitney's Simonian said. "Even with our training, it is still a large problem. It's not adequate to give people a directive and leave. The two-way communication trail is the largest single obstacle we constantly fight to overcome."

To that end, the company has specific policies regarding supervisory ratios (they are kept as low as possible) and the amount of interaction required between supervisors and employees. Managers are encouraged to meet regularly in small groups to discuss needs and frustrations, and there are formal appraisal programs for feedback on performance and status. "We work at it very hard, but it needs constant attention," Simonian said. "It's like growing grass — the minute you turn your back, you've got weeds."

For managers of MIS and DP, the pressure to understand the needs of employees and to communicate that understanding is greater than ever. "People change and the manager must be a good diagnostician to understand those changes," Weiss said. "Dollars may be critical to someone at [age] 23 but won't mean the same at 35. The manager has to see what really turns on that person. The bottom line is there is a strong need to be respected."

Training, the Computer Task Group's Stanley noted, is usually given a great deal of lip service but actually given low priority in most organizations (see story Update/17). For the DP and MIS environment, training in behavioral techniques and management issues must, in fact, become a high priority as that environment continues to change. Taking a technical person and reorienting him to the realities of the modern business world is a difficult task. But the companies seeing the greatest progress in retaining good computer professionals are the ones that have addressed these issues. "In shortsighted organizations, interpersonal training doesn't happen," Weiss said. "It's always on the back burner."

Management must also be cognizant of which people are interested in expanding their interpersonal skills and which people aren't. It should be clear, Weiss noted, if a systems programmer simply doesn't want to get involved with end users. Those people, she stated, should not be pushed into it. For others who want to expand their horizons, the company should provide the training.

These changes, of course, do not come easily. Weiss suggested training in the form of workshops and outside consultants. The use of role-playing, for example, often provides good results. Weiss recalled a mid-level manager who was having problems at home with his child. In the workshop, he took on the role of a systems analyst and came across as gruff and menacing. Unlike in his work and home environments, he saw clearly what was amiss. "These changes don't often come naturally," Weiss said. "People have to adapt."

Weiss

Acquiring these skills will pay off not only for the DP or MIS employee in his current position but will also provide a solid foundation for the step up into management. Unfortunately, up to now that route has been littered with casualties. As Walter Ulrich's Young said, the attempt to turn a techie into a manager is where the "Peter Principle [the theory that eventually a good worker will rise to his level of incompetence] really shines through. Taking a good technician and turning him into a bad manager really hurts at both ends."

Dual career tracks

Unfortunately, the time-honored business practice of rewarding outstanding employees with promotion into management has been particularly damaging in DP and MIS. Companies have recently begun to examine the possibilities of dual career tracks for technical employees. Though many have looked into it, few have implemented the plan. One that has, with success, is Eastern Airlines.

Eastern, according to Rodriguez and Labay, had suffered serious turnover problems with DP and MIS during the past several years as deregulation rocked the airline industry. DP employees at Eastern, fearing for their jobs, left in droves.

Rodriguez, left, and Labay

Having survived the storm, Eastern has recently turned its business problems around, and stability is beginning to return. With it has come an aggressive reshaping of many corporate policies; among them was the institution of a professional grading structure for DP employees. This track takes programming and technical people out of the main management salary structure and creates an alternative in which competent technical people can be promoted and given pay increases without becoming managers.

"You used to get up to the top of the technical level and there was only one way to go — into management," Rodriguez said. "If you had a fantastic technical individual, the only way to go up was to become a project leader or manager. Now that person can go just as high on the professional side."

According to Labay, this innovation has attracted quality staff back to Eastern. "We now have the salaries to entice people, and the professional salary structure gives advancement potential to those who don't want to be managers."

For those who do express interest in management, it is essential that their progress be carefully mapped out and monitored. Couger and Zawacki, in one of their studies, monitored the project leader position and discovered that there was a high level of dissatisfaction among these people. The cause, they found, was that young, first-time managers could not handle the pressure of reporting to two people — their own technical manager and the manager for the specific project.

"One [manager] rates them on their on-the-job performance and the other [manager] actually gives salary increases," Couger explained. "If you put a first-time manager in that situation, it creates a very awkward and difficult situation. It ought to be the second job in management."

Among the many technical occupations within DP and MIS, the one most prone to unhappiness and turnover is the systems maintenance person. Unlike applications and technical development, which are considered the leading-edge, glamour positions, maintenance has earned a reputation as a second-class, less-challenging job. Indeed, in Stanley's report on motivating DP personnel, he cautions against letting maintenance programming become someone's sole job function.

In a recent study of maintenance personnel, Couger found that managers were looking for ways to enhance maintenance tasks. "One company changed the name from maintenance to retrofit engineering," he laughed. "They figured if they changed the name, people would be more interested. That lasted about five minutes."

The interest in the field is motivated by economics, he said. Maintenance makes up 50% of the typical DP budget and is forecast to be 60% within five years.

Durant, in charge of maintenance programming at Manufacturers Hanover Trust, has taken effective steps to keep her people happy. She acknowledged that it is more of a challenge to keep maintenance people motivated, but she has had great success in this area by following some basic rules.

Durant keeps her staff of 45 productive and motivated "with a lot of TLC." She makes sure that she knows everyone by name, takes people to lunch, organizes after-hours activities and generally "fights for technology." Durant also encourages people to write letters of thanks for her staff's efforts and pushes management to recognize the quality work that is being done.

"My job is sales," Durant stated. "I have to generate work for my people. I do that by building a reputation for high standards, which attracts good people." Durant also pays close attention to the needs of her employees. She has the flexibility, she noted, to move people from one project to another if she senses they are getting bored. She also keeps an eye out for new technology and fights to remain state of the art.

"I have incredible respect for what my people do," she said. "It's a real challenge going into other people's code and figuring out what is happening with little or no documentation. There's incredible pressure to respond."

Ironically, Durant finds that some people get into maintenance because it provides a smoother path into management, unlike in development, where there tend to be many high-level people. She has also helped establish other career paths for those who eschew leadership and want to remain on the technical side of things.

Despite the innovative techniques companies have initiated, finding and keeping the DP and MIS staff continues to cause concern in corporate America. Companies facing increasing labor costs in all occupations have instituted flexible hours, increased benefits packages, telecommuting policies and many other innovative options to keep their staffs happy and intact.

For DP employees, the difficulties are even greater. Computer professionals continue to hold a social reference point for equity and fairness outside of the company. They are less interested in comparing salaries with, say, those of accountants within the company than with fellow DP professionals in other companies. This makes it difficult for managers to make sure their policies appear fair and equitable to the DP and MIS departments.

When supply reaches demand in the field, things will get better, Nord predicted. "It's still a relatively new profession, and there are a lot of people working in it who are not all that good," he explained. "And we haven't learned all we need to know about training and developing a good staff. It'll be a long time before supply reaches demand, and there's a way to go before it all settles down."

In the meantime, enlightened leadership can clearly make a difference. "If you keep talking to your people, you'll know when they are getting unhappy," Durant concluded. "Nothing replaces good management." ■

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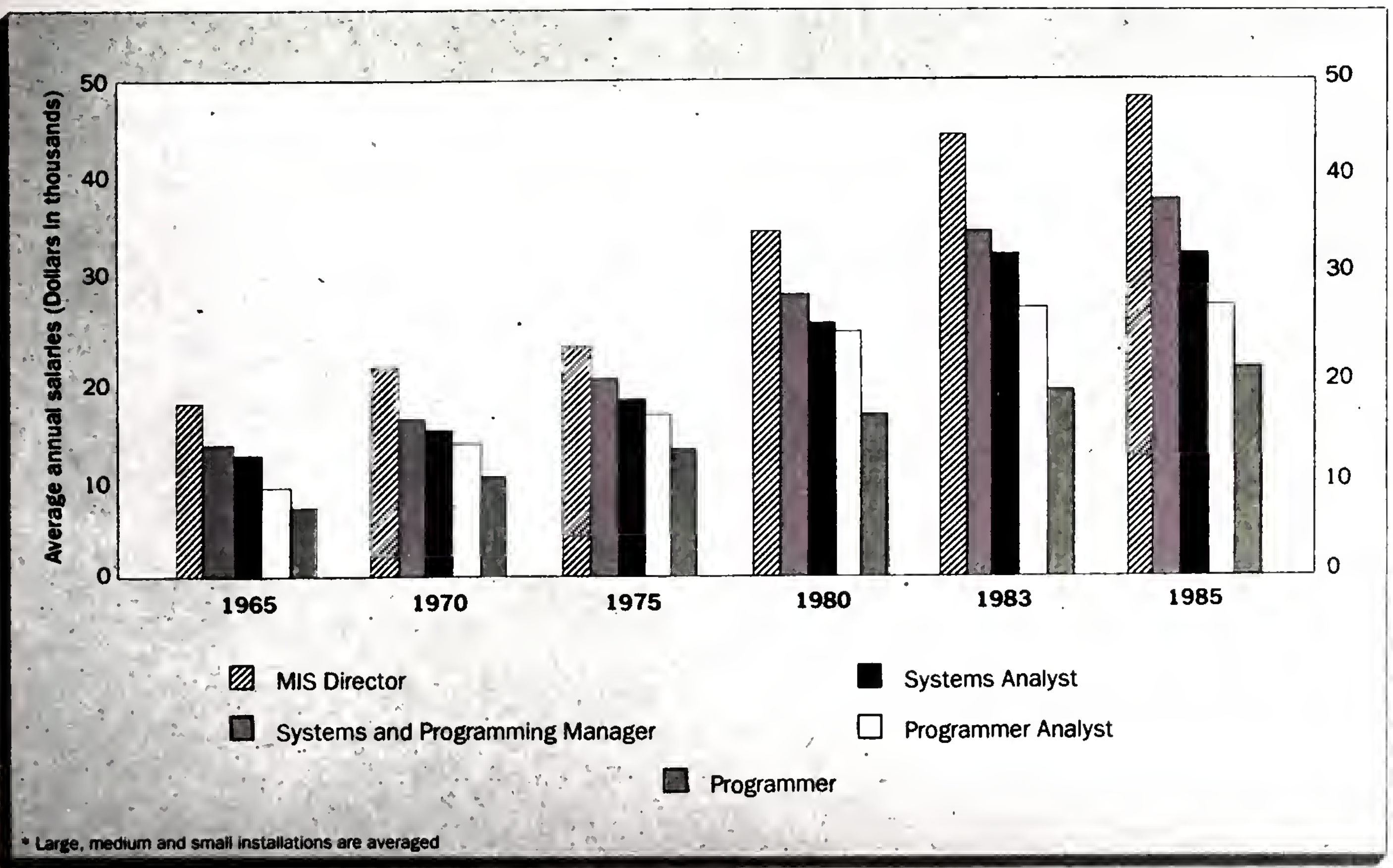

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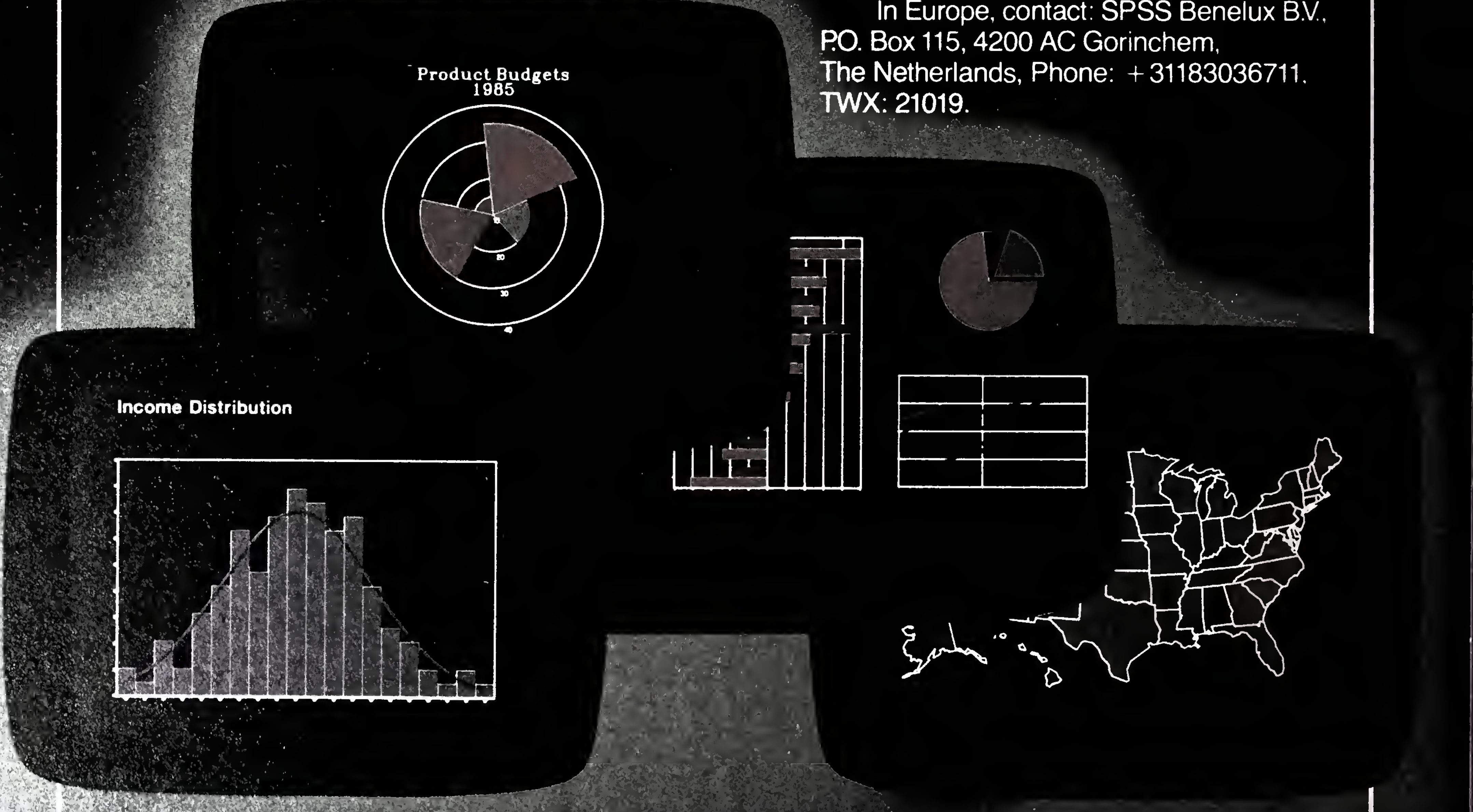

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LEAVE from UPDATE/20

stall and operate a system of employee development that can be managed so that the majority of the higher level job openings are filled by promotion from within. This can be accomplished through a series of promotions that will ultimately lead to new people being brought in at the lower levels of the department.

The method is to develop what might be termed a pipeline process. This entails a continuous employee development effort at all levels of the department. Under this process, people are encouraged to prepare themselves for higher level jobs, either in their section or in another section. These people are given first consideration for positions as they open up.

The pipeline concept requires that as people reach the higher levels of the department, they must make career decisions. The further up in the organization one moves, the less available become opportunities to continue advancing. As people reach higher levels, they must either accept and make peace with the fact that their future advancement opportunities are limited or move on to something else.

Making peace does not mean that these employees should go into semiretirement while still employed. It means they should be willing to accept and adjust to the reality that as one moves up the organizational ladder, opportunities to continue to advance become increasingly scarce. Even though further upward movement may be blocked, given the appropriate environment, it will still be possible for people to find new challenges and develop new skills.

This can be accomplished through lateral movement to a different area within the department. Opportunities outside the DP/MIS department, which offer new challenges if not advancement, may also be available.

Disgruntled employees who stay on board but are unable to make peace with limited prospects for advancement, tend to have a deleterious effect on everyone. In such circumstances, employees who at one time were productive and dedicated can become a detriment. Once people become unhappy with the organization, for whatever reason, it is in the best interest of everyone if they find employment elsewhere. Again, some turnover is welcome.

Some people, aware that they probably have reached the highest level they can within the organization, will choose to leave. This should be viewed, provided appropriate employee development work is in process, as a positive circumstance for everyone concerned.

> **Once people become unhappy with the organization, for whatever reason, it is in the best interest of everyone if they find employment elsewhere.**

The particular employee will have obtained a variety of skills and knowledge. The organization will have obtained the services of a very good employee. If the process is handled correctly, the parting should be amicable and should work to enhance the reputation of the organization.

Those who remain will also benefit. If the development strategy is correctly built, several promotions can be effected as a result of the departure of one senior-level person. The promotion of someone from within the department to this position from the next lower level can develop a cascade effect where a number of promotions can be realized within the department.

Clearly, the building of a pipeline development process requires strong departmental management commitment. ■

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WOMEN from UPDATE/11

This DP director felt especially battered because she had left a major Fortune 500 company after 14 years (during which time she had earned a master's in business administration) and took a DP planning job with a media/entertainment company. After nine months, that company went on the skids, and she was laid off with six months severance pay, few professional contacts and little sense of how to go about looking for another job.

Executive recruiters did not offer much solace. She wanted to stay in New York but didn't have the financial services background recruiters were all looking for.

"I'd look at the interviewer's face. His jaw would just drop open when I told him what I'd been making," she recalled. She also remembered the pain of hearing that a man 10 years younger got the job in question at almost the salary she was asking. "I think there are a lot of doors closed to women. I experienced a lot of discrimination while looking," she said about her job search.

Up against the wall

The problem is not the $50,000 or $60,000 wall, countered Chick Bisberg, a senior consultant with Halbrecht & Co., which specializes in placing systems professionals. "Feeling they're at a wall at $50,000 or $60,000 is the direct result of a lack of previous career planning," Bisberg said about DP professionals who feel trapped. "They're overpriced, making no technical contribution." They might also have "topped out" their careers, he said.

DP professionals aiming for annual salaries of $50,000 and above must buttress their backgrounds, Bisberg said. If they have a computer science degree, add a master's degree in business administration; if their background is in business, pursue technical expertise, he said. Personal computers have been a good technical entry point, but those opportunities are already drying up.

There is little bright news for women or men who have topped out. "It's a rude awakening," Bisberg said. To move on often requires major sacrifices in dollars and geography and retraining and rethinking of career directions.

> **In today's favorable DP economy, if a man and a woman are vying for the same job and the woman has stronger experience and commands a higher salary, the employer will hire the woman.**
>
> *— Chick Bisberg*
> *Halbrecht & Co.*

Overall, in today's favorable DP economy — at least from a recruiting standpoint — Bisberg finds that if a man and a woman are vying for the same job and the woman has stronger experience and commands a higher salary, the employer will hire the woman.

Likewise, "while more women today are getting promotions, fewer women are being promoted simply because they're women," he observed.

In fact, many women have found favorable niches for themselves in DP-related fields, according to research by Cognos Associates, a non-profit research group in Los Altos, Calif., which studies women in the electronics industry. "Women whom we talk to express a high degree of satisfaction working in electronics — higher than in other industries," reported Judith K. Larsen, coauthor of *Silicon Valley Fever* and a social researcher on the impact of technology.

Good news, bad news

"Electronics is still expanding so rapidly, there are more job opportunities," Larsen explained.

The bad news, however, continues to be salary. Studies have shown that women continue to earn less money than men who are in comparable DP positions.

The good news is that opportunities for women continue to improve, especially for women breaking into the new, hot technologies such as telecommunications, artificial intelligence or fourth-generation programming languages. Entry-level professionals must position themselves now for these areas of expertise, Bisberg said.

Four years ago, the hot technology was personal computing, and Margaret Levine, who received her computer science degree from Yale University, found herself less interested in how the computer worked and more interested in what people were doing with machines.

After joining the MIS department at Columbia Pictures in New York, Levine was put in charge of purchasing personal computers. Though she has since left Columbia, she contends that working with micros opens opportunities to women, especially as personal computer applications and word processing, a traditionally female field, come together. ■

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"SoftView is a very easy, effective, and inexpensive means of sourcing." - Vincent

The service has been in development and testing for the last several months, with only a handful of local client companies participating. Now that all development work has been completed, SCL director Paul Vincent expects SoftView to generate a great deal of interest among companies and applicants alike.

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HUNT from UPDATE/6

ers and employment agencies. These people, Gaines said, tend to be guarded and distrustful and won't return phone calls.

Among the current hot disciplines are telecommunications, network management, product development and systems software.

"It's hard to find people who can balance technical issues with management abilities," Gaines said. "That's our biggest problem. Almost all our searches are geared not to technicians but to those who can initiate and carry out the goals of the business. But we can't have someone with just management skill; they must have the technical skills as well."

The searches tend to be national in scope and focus on major urban areas where the best and the brightest are usually entrenched. Gaines finds it difficult to entice people from vendor organizations into user jobs. "Users are not as associated with innovation and new products," he explained. "But then again, innovation and drive don't necessarily lead to good management skills."

The key factor in tapping a candidate, Gaines pointed out, is whether that person is looking for a job or the search firm is creating the impetus for a move. "When we reach a person who is not looking, we need to create the motivation for switching," he said. Though salary is important, the determining factors lie elsewhere. A bigger, more important job with less constraints of corporate bureaucracy and an environment more attuned to innovation are major selling points.

"We don't want salary to be the prime motivator, although the opportunity for substantial increase may be there," Gaines said.

Gaines also avoids job-hoppers and 20-year veterans, feeling that extremes at either end are negative attributes.

Once he has found his candidates, Gaines begins the lengthy process of assessment and invites them in for interviews. "I try to determine the true quality level; how strong are they really?" he said. "How are their leadership and management skills? What are their goals? Are those goals compatible with the goals of the company? Is their style synergistic with the company, or will they create conflict? What is the depth and breadth of their knowledge?"

Gaines keeps in constant contact with the client company, giving progress reports and arranging follow-up interviews. Once he has sent the candidate to the client, Gaines does not step out of the process.

"We try to bring closeness to the match," Gaines explained about his recruits. "In more than 90% of the cases, the people we provide thrive in their new jobs. They establish long-term relationships." ■

Executive Interview

Al Smith
Atlantic Richfield

CW PHOTO BY GEORGE HARRAR

By George Harrar
Features Director

Al Smith is the manager of Corporate Units Information Services, the systems provider to Atlantic Richfield Co.'s headquarters in downtown Los Angeles.

Arco's annual revenues declined only slightly in 1984 to $24.6 billion. But net income plunged from $1.5 billion to $567 million, mainly because of excess crude oil and refining capacity worldwide. The nation's sixth largest oil company is retrenching by divesting unrelated businesses. The massive restructuring will take two years.

Pushing office automation isn't easy anywhere these days, but it's particularly tough in a company with its mind on oil. That's Al Smith's job. He was interviewed in his 21st-floor office in the "Arco building."

What is the priority of office automation in a giant oil company such as yours?
It's mixed. Obviously, when you have different operating companies, there are different priorities. We in corporate started as early as 1979 to begin to look at office automation and personal computers — we actually bought our first personal computer in 1978 or 1979.

From which company?
It was an Apple, as a matter of fact, just to see what it could do. We put Ethernet on this floor in 1980, and now we have expanded it to several other floors. So we've been working with Xerox Stars and some 860s. Now we've added personal computers to the network.

Which personal computers?
IBM.

They work on Ethernet?
Yes, there's a new board and a new system and we've been testing it for several months. Now it's up and running. We haven't done a lot of integration with it, but we're starting to use the services available on the network.

Getting IBM Personal Computers to work on Ethernet is a challenge.
It has worked, but as I say, we haven't tried to do every little service that you can do. It seems to function.

"I believed early on that we're going to work a lot differently as we put more workstations on people's desks."

Are these ATs or XTs?
XTs, basically. We haven't tried to put the AT on Ethernet. We think it will work. I think there are several ways we could do that. But we don't have a lot of ATs yet, anyway.

What services are available through Ethernet?
We can do messaging from the different floors and some mail services. We can transfer documents — we do a lot of that.

PROFILE

ATLANTIC RICHFIELD

Corporate headquarters - Los Angeles
Annual revenue(1984) - $24.6 billion
Number of employees - 39,000
Main business - Petroleum refining
Mainframes - IBM 3030 and 3080 series

How many floors are linked by Ethernet?

Arco occupies about 30 of the 50 floors in the tower here. Four or five floors are wired up. We communicate data back and forth between our employee relations people and my staff.

Will you expand to more floors?

As the need arises. One of the reasons we did this was to learn about local-area networks and the impact of office automation. It was our belief early on — my belief, anyway — that we're going to work a lot differently as we put more workstations of one kind or another on people's desks. We've learned a lot from the pilots we've done.

What have you learned?

One is that relationships change between people. For example, just in our case on this floor, the secretary is no longer the font of all knowledge. Documents get prepared without the secretary even seeing them in many cases, including multiple distribution. A lot of our people are now beginning to use these things in lieu of yellow pads. They just don't write anymore. They're creating on the terminals. We've seen a lot of synergy and creativity; we're seeing things done much more effectively.

One of the things we noticed in our employee relations pilot was that the decision cycles come down radically. An employee relations manager would, in years past, ask for some statistical data in graphics form; it would take several weeks to gather the data and pull it all together. Now, basically, with various spreadsheets and graphics packages, they can pull this together in two, three or four hours quite often, and that becomes the accepted norm. Now if it takes longer, that causes an issue. The cycle that people plan to produce documents, the way in which they expect things to happen, becomes compacted.

Some of the benefits of office automation that you mention are intangible.

No question about it.

How do you prove your case financially?

With great difficulty. We have had several office automation pilots that clearly demonstrated return on investment — a very large return in the 30% range — where we've been able to calculate the before-and-after costs of running the function and demonstrate that it paid. We have had some other projects where there are clearly intangibles. We can't extrapolate from one to the other and say, therefore, that everyone will save X amount of money.

Tell me about a pilot project that failed.

Let me think about that. We had one years back where we put in some equipment — I'd really rather not get specific about equipment, because it sounds like I'm panning someone, and I'm not. We put it in, and it really didn't do what we wanted it to do. We learned a lot about how people receive things — it was basically a clerical and secretarial pilot, a predecessor to the Xerox Ethernet. We learned a lot about what we did want because of what we couldn't get with this.

Ethernet and Xerox don't have the strongest reputation in office automation. What has been your experience with the two, the company and the network?

I think we have done good things with their products. They have worked hard to support us. We think they

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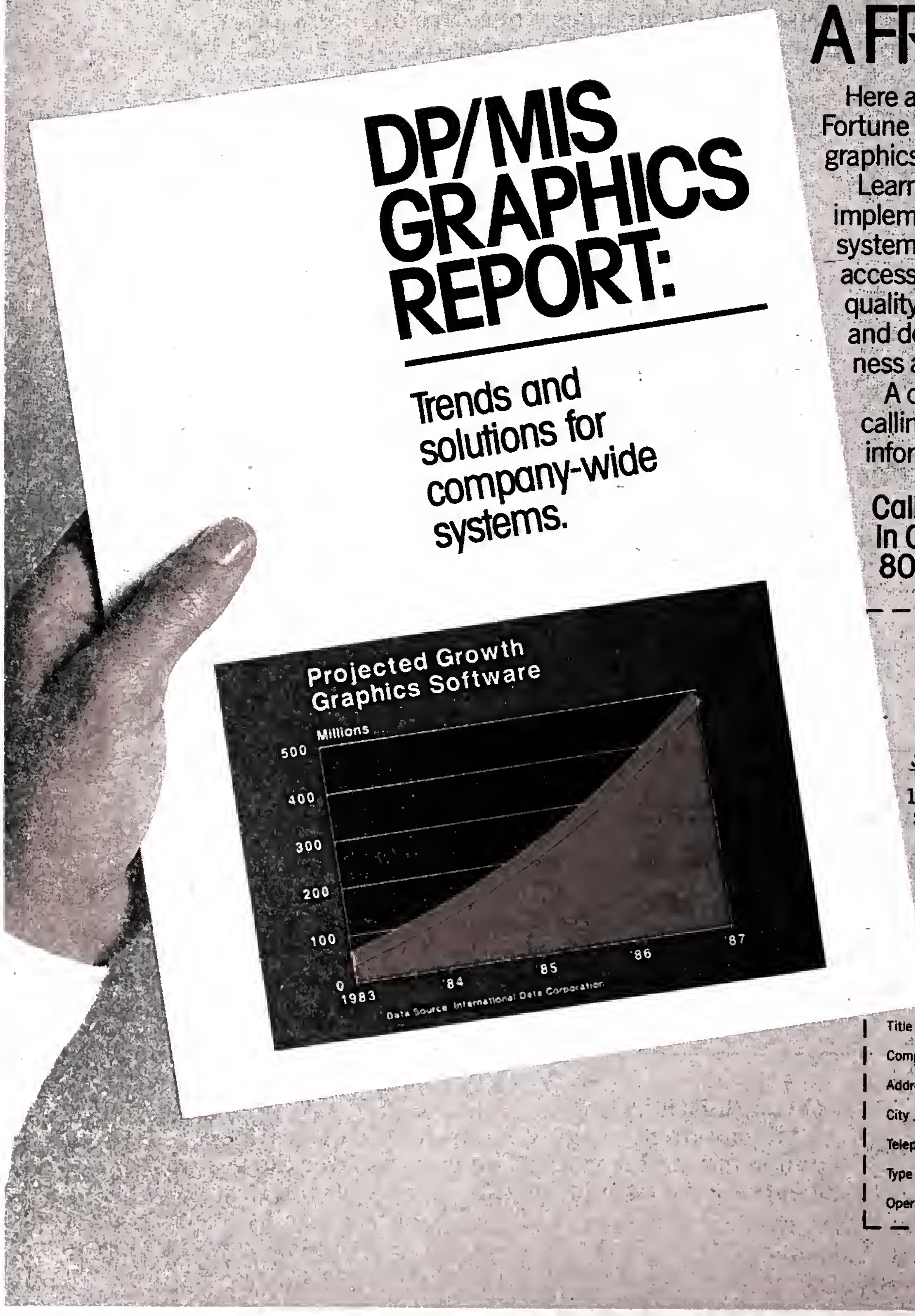
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are beginning, maybe, to improve on what they can do with the network, and we're pleased with that. There are many things we've wanted that we haven't been able to get. That's partly because Xerox has been restructuring, and there have been a lot of changes. From a service and support standpoint, it has been acceptable.

In retrospect . . .

Oh, I still think it was an excellent decision, absolutely. I have no doubts about that. There aren't many games in town, from a local-area network standpoint. When the [Xerox] Star existed in 1979 and 1980, there just wasn't anything else on the marketplace like it. It is tremendously powerful and easy to use. We went into it with the idea that we would learn a lot.

We're not trying to proliferate it everywhere, though our ultimate goal is that probably by the end of the decade maybe 75% to 80% of our people will have a workstation on their desks. In one form or another, we're probably at about 40% or 45% already.

If power and ease of use are the benefits of the Star, what are the drawbacks you have identified?

The Star is not quite as fast as it should be — everyone knows that. For some people, it's just more machine than anybody needs. There are so many things you can do with it, some people just don't need that much. There have been no major drawbacks. The thing just runs and runs. We don't often have any hardware problems. We'd like a little more software.

What software do you lack?

We want more integrated software to allow the office to function together. The big problem there is that until we get enough workstations on people's desks, it doesn't matter — you're not going to do calendaring and vast electronic mail. Those things aren't much value if you can't get to the people you need. We feel we have to build up that mass before we can do things like calendaring automatically and get total use of electronic mail.

Ultimately, what I'm looking for is a more integrated set of software that allows all these functions to tie together almost anything you could do in the office from an administrative or document or general-function standpoint.

Does that software exist, even outside of Star and Ethernet?

I don't really think so. I don't think anyone has done it yet.

Is any vendor close to offering this total solution?

No, and we're talking to a lot of different people. I'm sure it's going to happen. People are coming along, but I don't think anyone's there yet. Maybe we're always going to be ahead of where the vendors are, so it's hard to say that end users are totally satisfied. I'm not trying to throw rocks, because it's a very difficult world we live in today. The vendors are trying to change, and we're trying to change. It's tough.

What percentage of the workers now have terminals on their desks?

We have roughly 27,000 white-collar workers — that doesn't include factory, plant or oil field staff — and we have about 9,000 workstations in one form or another. That includes IBM 3270 dumb terminals, in many cases. But still, they have a workstation of some kind. Many of those 3270s are for engineers, and they use them for real functions. So about one-third have something. There are about 1,900 people just in corporate and about 700 workstations.

> ”
>
> *Ultimately, what I'm looking for is a more integrated set of software that allows all these functions to tie together almost anything you could do in the office.*

Have the operating companies made the choice to go with Ethernet and Xerox?

No, actually, nobody else in the operating companies has a local-area network. There are several IBM Professional Office Systems.

Are you considered a test site for the operating companies?

We share a lot of what we learn. We meet four or five times a year. My boss, the vice-president of Administration and Technology, chairs [the meetings]. We bring my peers together. We look at overall policy. We also have a planning council and communications and research councils at various levels meet and share information. We have a reasonable communication. I don't think we're totally duplicating efforts.

Do you have a specific, written multiyear plan at corporate headquarters for introducing or spreading office automation?

We do. We did a strategic, long-range plan, but it's at a fairly general level. It's not down to device by device and when we're going to put them in, but [it tells] the areas where users want us to put devices in. We're moving rather cautiously right now, primarily because of economic hard times. We're taking a hard look at when the right time to do this will

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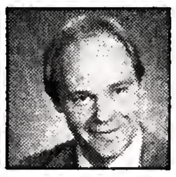
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be. We think in the long run it will be cost-effective. We have to prove our case thoroughly.

We continue to do pilots. For example, we have a project that will go in this year that is a combined look: from an office planning standpoint, from a communications viewpoint and from a systems standpoint. The three disciplines are working together to do a pilot with our employee relations people. We're expanding a pilot we did with them to put a workstation on everyone's desk in that unit and to give them more function. It will be a combination, using Ethernet and access to mainframes.

What specific applications are driving office automation?

Spreadsheets are obviously one. Then there's word processing. Graphics is the third area. Many people will say, "If I can have a spreadsheet and a terminal or a personal computer — wow, I can do this and thus and so." They really can cost-justify any number of things. But it's all the other things that they didn't think they were going to do that make the difference.

For example, our employee relations representative now mails all of her messages back and forth with my secretary. We don't make phone calls, at least not very often. When we put in the network, we never put it in with the idea that the two floors could talk together, though we recognized that they could. We've eliminated a lot of the time lag on things that we never thought about.

When employees on one of the floors not served by Ethernet ask for a stand-alone personal computer, is it your concern that whatever micro they get will eventually be able to work on the network?

Yes, we have an approved vendor list for hardware and software.

What models do you recommend?

Basically we're an IBM organization, and we have IBM. We have Xerox here at corporate. There are some Macintoshes growing throughout the corporation. Some of the operating companies have purchased Wang equipment. The basic three for corporate are Hewlett-Packard Co., IBM and Xerox right now. We're giving some consideration to Apple. We have approved Macintoshes for special situations.

It's a tough job to hook up that assortment of micros.

It is, but the IBM Personal Computer will work on Ethernet.

Is that a recent phenomenon?

We just really put it up in our last release in February. We've actually communicated between HP devices and Ethernet. We don't do a lot with it yet, but we could. It's technically feasible. We're not sure that's the ultimate network we'll have. I don't know what network we'll finally end up with. We're trying to piece the things together slowly.

One of the advantages we have in the corporate area that you wouldn't get in an operating company is that there is not a great need for finance to talk to public affairs. They do have some dialogue, but they don't use a lot of the same data, they don't do a lot of cross-communications, so there's no great need for sharing. We try to make everything SNA-compatible and IBM-compatible. That's one of our prime criteria. A vendor either is, or is going to be, IBM-compatible. Of course, everyone claims they're going to be, and they all are, to varying degrees.

Because you have IBM Personal Computers running on Ethernet now, does that mean you will purchase fewer Stars?

It depends on the functionality. We'll buy what we think is the right device for an individual's set of requirements. When people come to us — and most people come to us rather than make a decision on their own — and say, "Gee, I'd like to get a device. Here's what I think I need to do with it," you go through requirements analysis just like you do for any other system.

You have to understand if they want to do word processing or something else. And then you work out what's the best fit.

Does the president of Arco have a micro on his desk?

No, but there are personal computers for each of his three administrative staff. We now tie them together. They use them for his itinerary, his mailing list, all kinds of things, plus word processing. There are several other executives, including the chairman's office, where we're piloting [personal computers]. Ultimately, we'll probably tie them together, but we haven't attempted that yet.

Does that help make your case for OA elsewhere in the company, to show the president what computers can do?

I haven't seen a noticeable impact yet. Ultimately, will it? Probably. But short-term, there hasn't been a great impact, because it's not that noticeable. You'd have to publicize it. But they feel they're getting a lot of benefits out of it.

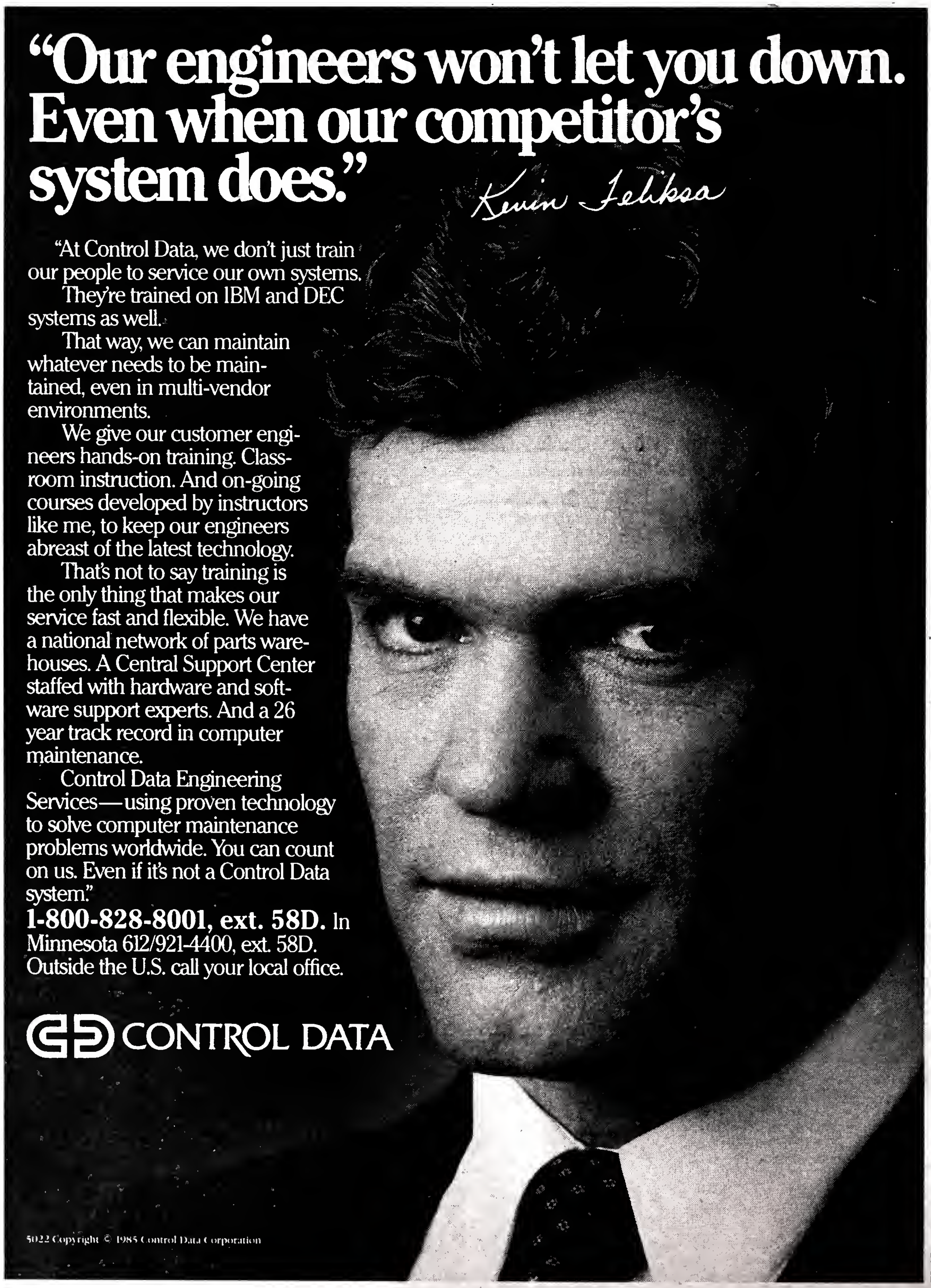
The one thing we have found is that once someone has a device on his desk, your chances of ever taking it away are extremely remote. There are some people who don't take to it, but not many.

What about your own use of computers?

I do everything verbally. I dictate everything. I don't type.

You don't know how to type or you don't like to?

I don't like to type. I can, but not very fast.



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So you're a prime candidate for a speech recognition system.

Absolutely. That's the way I work. I dictate almost every memo of any size and all my speeches.

What are Arco's mainframe systems?

Our products companies have various 3080 systems, and Dallas is a very large center with a whole series of 3030s and 3080s — all the big mainframes. It's our main computing center for oil and gas, the seismic processing, engineering, all those things.

You would be a very interested observer of IBM's 3090 series?

Yes, very interested.

Do you need that power right now?

Undoubtedly we will, but we have no immediate plans to buy. I would anticipate that our marketing and our gas company would end up with 3090s in one form or another.

What systems do you have here at headquarters?

We have an HP 3000 that's really a decision support system for our finance people. Then we have some Four-Phase systems for public affairs.

We put it in many years ago and it runs and runs. We have links to IBM, lots of personal computers. I don't have a big mainframe back here, just because we find it more cost-effective to use the mainframe in an operating company here in Los Angeles. We have a number of IMS applications.

Do you personally interview and hire systems people?

Not as a rule. I do on some occasions, and I keep track of whom we hire.

For an entry-level person, do you prefer a computer science graduate or a liberal arts graduate you can train?

I just want very good people. The first thing I look for in my own hiring — I hire the managers — is that I want them to be good at communicating — I want bright, intelligent, outstanding people. That's the first thing I want.

At the corporate level, we don't have a lot of entry-level people, but we've had some computer science graduates and some MBA graduates, quite often with engineering backgrounds. I guess if I have a preference it's for MBAs with some other discipline in their background, but it's not an overwhelming preference. Talent is what counts, and quality, and you can get that a lot of ways.

Arco's Alaska Kuparuk pipeline

Are universities turning out the kinds of people you need for information systems?

We put most entry-level personnel through a training program. I think the colleges are doing a reasonable job; I think they could do a better job. The curriculum is getting better, more pragmatic.

The truth of the matter is that they teach them the basics, but what the real world is all about has to be taught on the job. I don't know if you'll ever get the colleges to do that, and maybe they shouldn't. I teach at UCLA myself off and on in the master's program.

What course do you teach?

Introduction to Information Services — basically, it's an overview of the whole field.

Is there a shift at Arco to end-user programming?

Oh yes, clearly that's going on throughout all the operating companies. A lot of students who don't have science degrees — MBAs and other students — come in expecting to have the tools at their fingertips. I'm firmly convinced that in some time frame, let's say five to 10 years, people are going to expect to have a workstation on their desks like they now expect a telephone. I don't think we're too far from it. And I believe it will be a workstation integrated with the telephone.

Has there been any corresponding easing of the load on data processing?

I would say in our development group in my organization, the demand is still there, and we have as many people working on it as we did. But we aren't growing as rapidly from a development standpoint. We're putting more resources into supporting end-user computing. For example, about 2½ years ago, I combined the pilot work we were doing in office automation into what I call professional computing support. It's a group dedicated to helping the end user. It supports our decision support system, office automation and workstations. If they want us to build a system, our systems development people do it in a more or less traditional way. But where we really impact those individuals is we teach them what we have to teach them. We'll help them if they need help, but if they can do it themselves, we encourage them.

Is that an information center?

In a sense it is, but it's more than that. An information center is just a label appended to an approach to giving people data that they can massage and inquire and use however they choose. That's not a great deal different than having a workstation with a spreadsheet — then you have to get some data or create the data. In most cases, the people in the information center don't do the work. They just get the data for you and you do the work as the end user. So I put all of those in a generic category that we call professional computing support — end-user computing, if you will. I just don't like the term. They're all driving to put tools on the desks of professionals so they can do their work. That's what we're after. When they want a system bigger than they can do, then they come to us and we build it.

How would you assess the position of Arco in terms of implementing and using leading-edge technology — an initiator, just behind the initiators, in the middle of the pack, far behind?

That's a tough question to answer. It varies by operating company, because it depends on the circumstances, both economic and size, and environment. We have some areas

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where we are clearly initiators and some where we are behind the initiators a little bit and some in the middle of the pack.

In what area is Arco clearly an initiator?

In Dallas, we were one of the first to put a Cray in to do seismic processing. We've been innovative in using Ethernet here. We jumped into the information center fairly quickly. We're somewhere between middle of the pack and right at the state of the art.

Is that where you would like to be?

Yes. We don't want to lose our competitive edge with respect to our own industry. But I think the technological impact of computing is somewhat different for the oil industry than it is for finance or the airlines industry. We have some very big technology decisions that have little to do with computers, such as how to drill for oil in the North Slope. So it's a combination of pure hard technology and computing technology. Now, the pipelines are automated, and our refineries are automated to a great extent. Data processing numbers for Atlantic Richfield are roughly $300 million a year. There are roughly 2,500 people in computing.

How does Arco get information from the oil field to the headquarters?

We were one of the first to put some kind of microcomputer in our drilling and production sites. For our seismic data, we actually take the shots and communicate the data to the main computer in Dallas.

Are expert systems used?

We're looking hard at expert systems, but nothing is in place right now. Are there opportunities? — Oh, yes, there's no question that there are opportunities. We have a couple of task forces looking at it.

Recent ads for Arco emphasize innovation. What part can information systems play?

We do play a big role in innovation. One of the ways is to give people end-user computing. If they use it more effectively, then it's clearly to the benefit of the corporation. Arco puts a lot of emphasis on more innovation, more productivity, from our president right down.

What previous positions have you held here?

I joined Arco 12 years ago as a systems consultant. After a couple of years there, I was promoted to managing the corporate and DP auditing function. I did that for 2½ years and then moved to this job.

What was your experience before Arco?

I have more than 25 years of experience — six years with the Computer Science Corp., a couple of years with General Electric when it was in the computer business and four or five years with an end-user organization before that. So I've been with a user and a vendor and a consultant, a little with everyone. I somewhat intended it that way, but who knows where your course is going to end up when you start out to do something?

I fell into computing when I got out of college. I have a bachelor's degree in economics with a minor in accounting, and I set out to get into the accounting field. But I got one job offer to get into systems before I got the job offer to get into accounting. Since I was young and needed money at the time, that's the one I ended up with. I have no regrets. I sort of knew what systems was. I had some friends in school who had gotten into it, so it wasn't a total accident on my part. But I didn't realize what it would mean to me in years to come. I've gone back to get a master's degree from USC in business management, and I've done a lot of doctoral work in management at USC.

As a systems consultant here, you weren't managing anyone, I assume.

I had been a manager at Computer Science Corp. I was first a manager when I was 25 — I managed a systems group about four years out of college, because there weren't a whole lot of folks around, so you moved up quickly if you could survive and do it. I've done a lot of management work and individual contributor roles over time. I prefer the management role.

What do you like about it?

I enjoy getting the job done through people and working with people — also the broader perspective the management role gives you. You have to look at the whole picture; you can't just worry about a project. Project work can be fun at times, but I prefer the management role.

How many people report directly to you?

Three people, right now. We're probably going to restructure, so it will be five.

And through them to you?

Right now, about 80 people.

If I were to talk to the three who report to you directly, what would they say about your style or philosophy of managing?

That's interesting. We just went through a survey recently and got some feedback on that. I guess they would say that I am a delegator, that I let them do the job. I trust people. I don't want any problems buried. I like to know what's going on, but I don't look over their shoulder every 30 seconds. We have a fairly participatory environment here. My basic philosophy is this: We can solve almost every technology problem there is one way or another. The real issue in business — and it is true in

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A. The fact is, all modems are not created equal. For example, some modems are better signal processors than others. And these superior modems can make an important difference in your total network performance. A difference that can lead to important savings in telecommunications costs.

Q. How can a modem make a difference in my telecommunications costs?

A. The primary purpose of a network is to move information to and from end users and thereby improve their productivity. And a superior modem can improve the performance of your network in at least four areas: It can make your network more reliable. Give your end users faster response times. Minimize the time you and your people spend on network management. And a superior modem can also save you money in line charges.

Q. What makes a superior modem?

A. As you know, a modem converts a data stream into a signal that can be sent (usually over a phone line) from Point A to Point B.

Now that may sound simple enough, but there are a number of variables in that seemingly simple scenario. Such as, what's the distance between Points A and B? What's the line between the points? What's the condition and stability of the line? And many, many more. The point is, each variable carries technical implications that affect the design of the modem. And simply stated, a superior modem enjoys a superior design.

Q. Be specific. How can a superior modem save my company money?

A. Let's face it, modems are not the most expensive part of your telecommunications network. Chances are, line charges are. If you design a modem that can send data more reliably, then that modem can begin to affect your line charges. Every time a modem has a "hit," or an unsuccessful transmission of data, the data must be retransmitted, slowing down response time. The net effect is a reduction in the amount of information carried by the network.

If you use superior modems that give fewer hits, you'll have lower line costs per data unit transmitted and better throughput. Better throughput translates into time and cost savings.

Q. Can a superior modem correct the problem of faulty lines?

A. A superior modem can go a long way toward compensating for poor line conditions—and thus make marked improvements in the hit rate.

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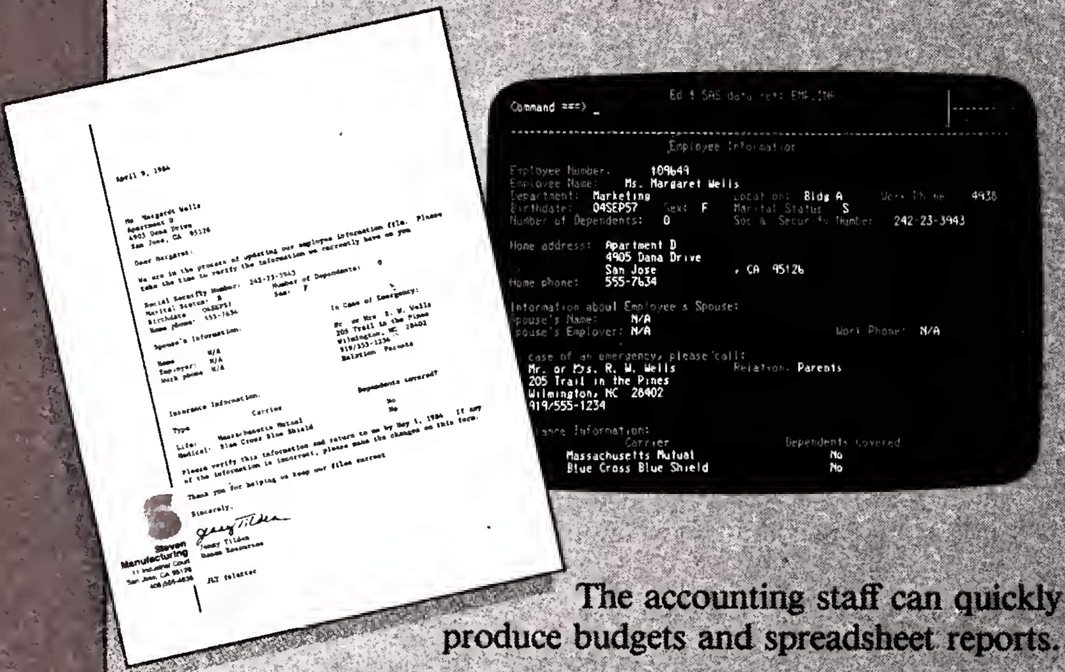

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--------------------------------------------------------------------
                        Employee Information
Employee Number.         109649
Employee Name:      Ms. Margaret Wells
Department:  Marketing              Location:  Bldg A      Work Phone    4938
Birthdate:   04SEP57    Sex:   F    Marital Status   S
Number of Dependents:    0          Social Security Number   242-23-3943

Home address:  Apartment D
               4905 Dana Drive
               San Jose                  , CA  95126
Home phone:    555-7634

Information about Employee's Spouse:
Spouse's Name:      N/A
Spouse's Employer:  N/A                          Work Phone:  N/A

 case of an emergency, please call:
Mr. or Mrs. R. W. Wells        Relation: Parents
205 Trail in the Pines
Wilmington, NC  28402
919/555-1234

 ance Information:
              Carrier                       Dependents Covered
      Massachusetts Mutual                          No
      Blue Cross Blue Shield                        No
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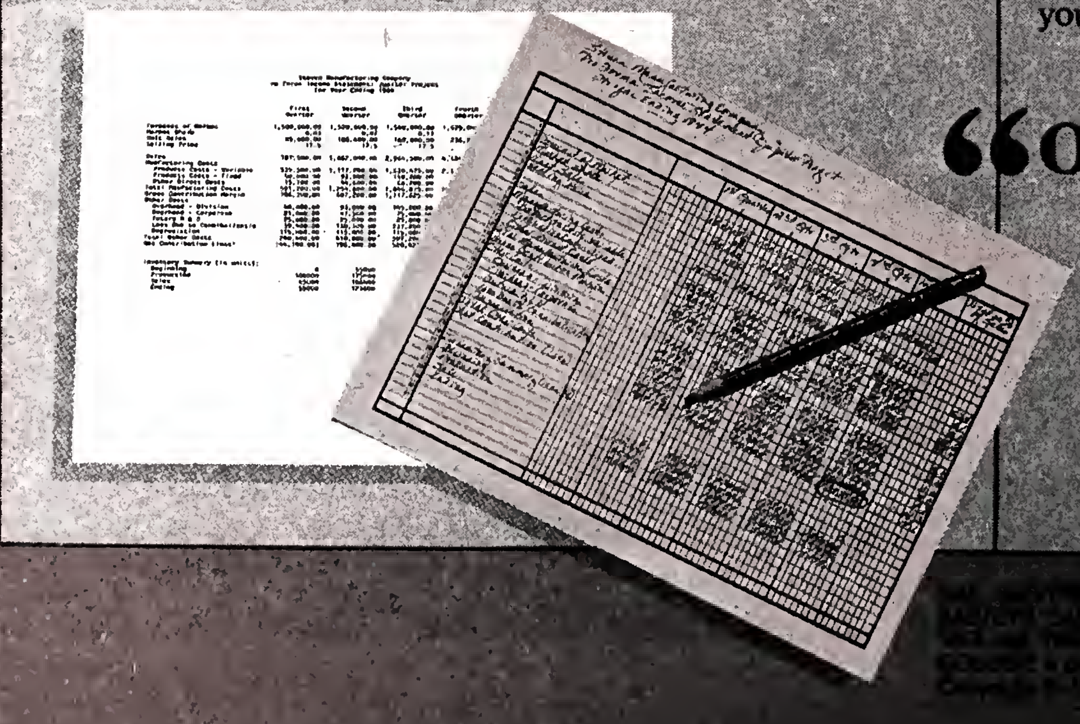

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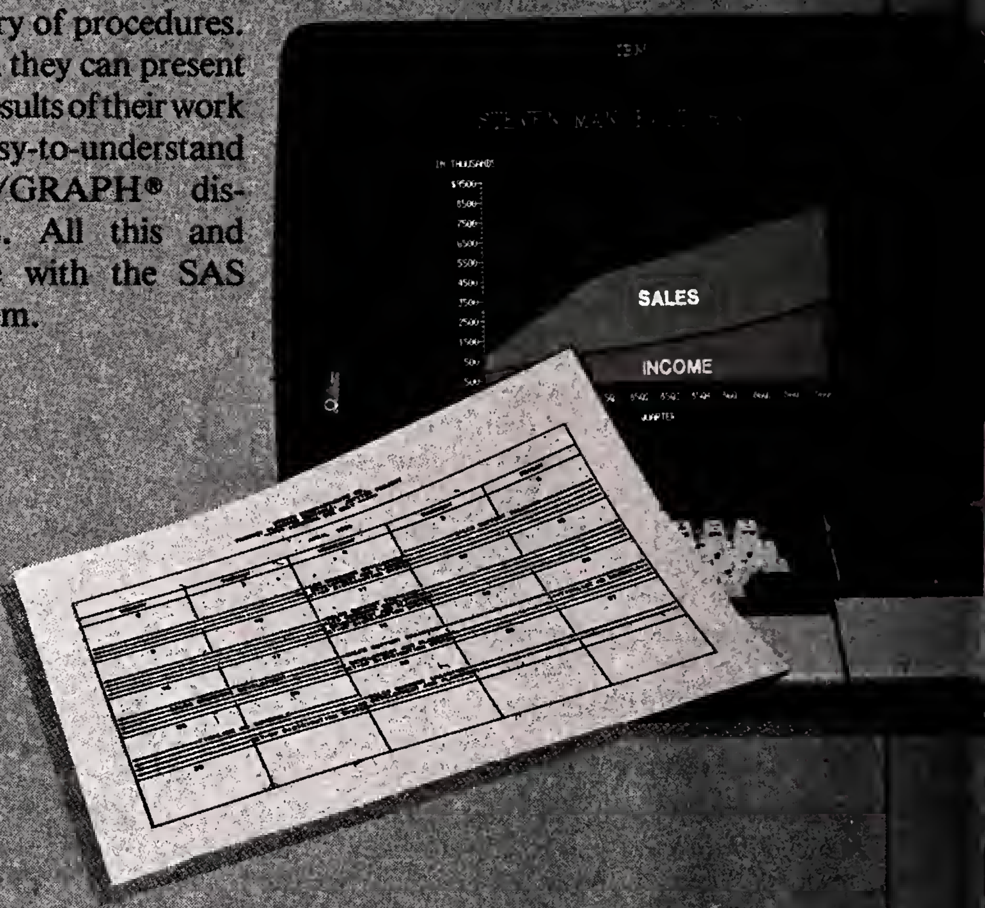

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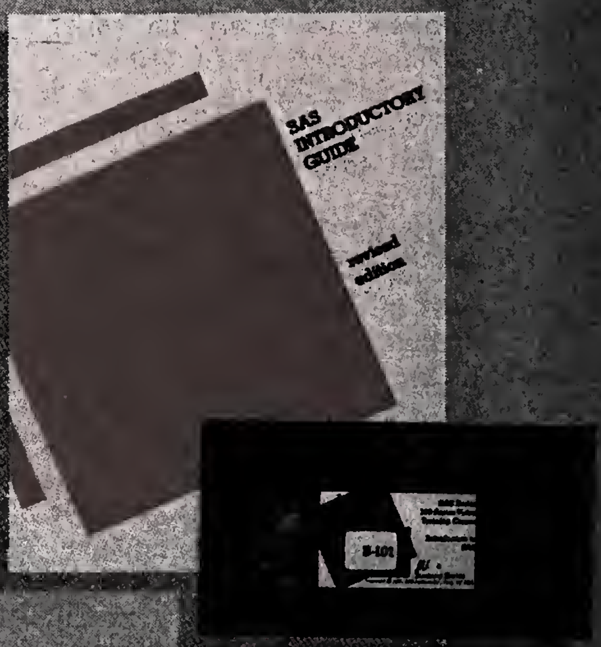

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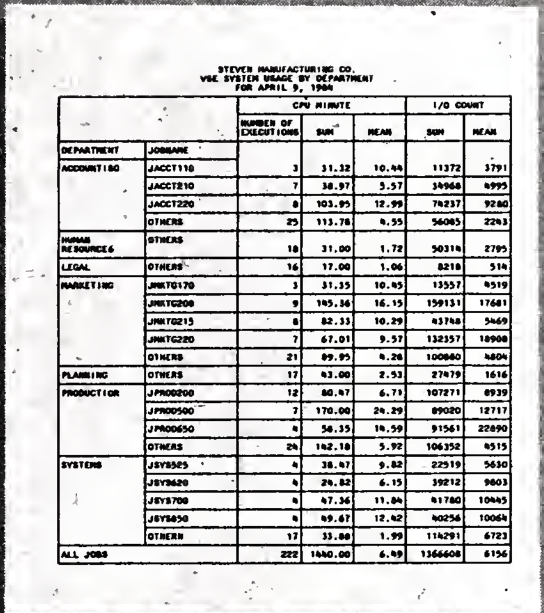

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		CPU MINUTE			I/O COUNT	
		NUMBER OF EXECUTIONS	SUM	MEAN	SUM	MEAN
DEPARTMENT	JOBNAME					
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	JACCT210	7	38.97	5.57	34968	4995
	JACCT220	8	103.95	12.99	74237	9280
	OTHERS	25	113.78	4.55	56085	2243
HUMAN RESOURCES	OTHERS	18	31.00	1.72	50314	2795
LEGAL	OTHERS	16	17.00	1.06	8218	514
MARKETING	JMKTG170	3	31.35	10.45	13557	4519
	JMKTG200	9	145.36	16.15	159131	17681
	JMKTG215	8	82.33	10.29	43748	5469
	JMKTG220	7	67.01	9.57	132357	18908
	OTHERS	21	89.95	4.28	100880	4804
PLANNING	OTHERS	17	43.00	2.53	27479	1616
PRODUCTION	JPROD200	12	80.47	6.71	107271	8939
	JPROD500	7	170.00	24.29	89020	12717
	JPROD650	4	58.35	14.59	91561	22890
	OTHERS	24	142.18	5.92	106352	4515
SYSTEMS	JSYS525	4	38.47	9.62	22519	5630
	JSYS620	4	24.62	6.15	39212	9803
	JSYS700	4	47.36	11.84	41780	10445
	JSYS850	4	49.67	12.42	40256	10064
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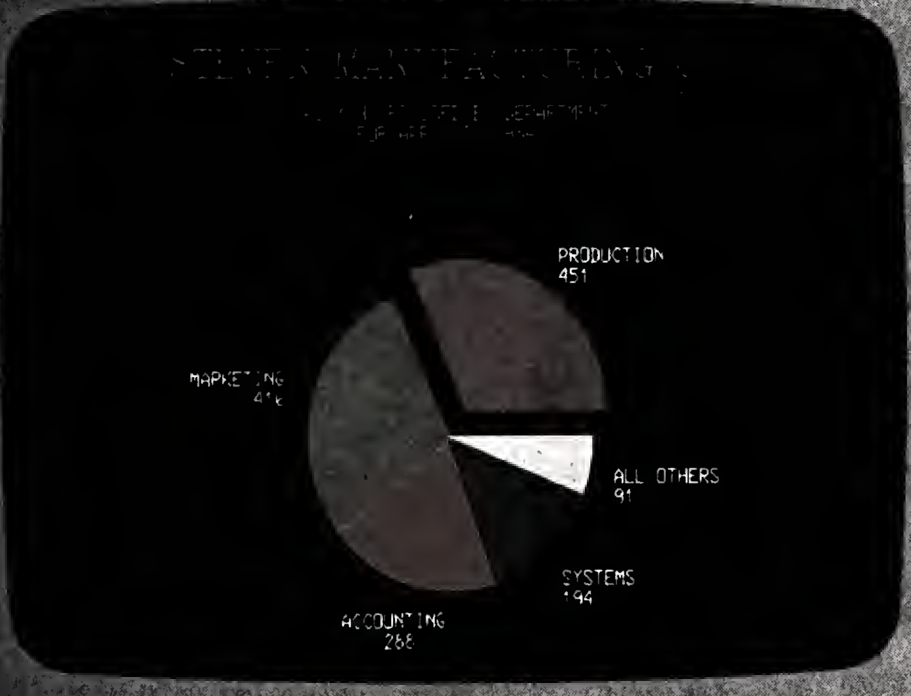

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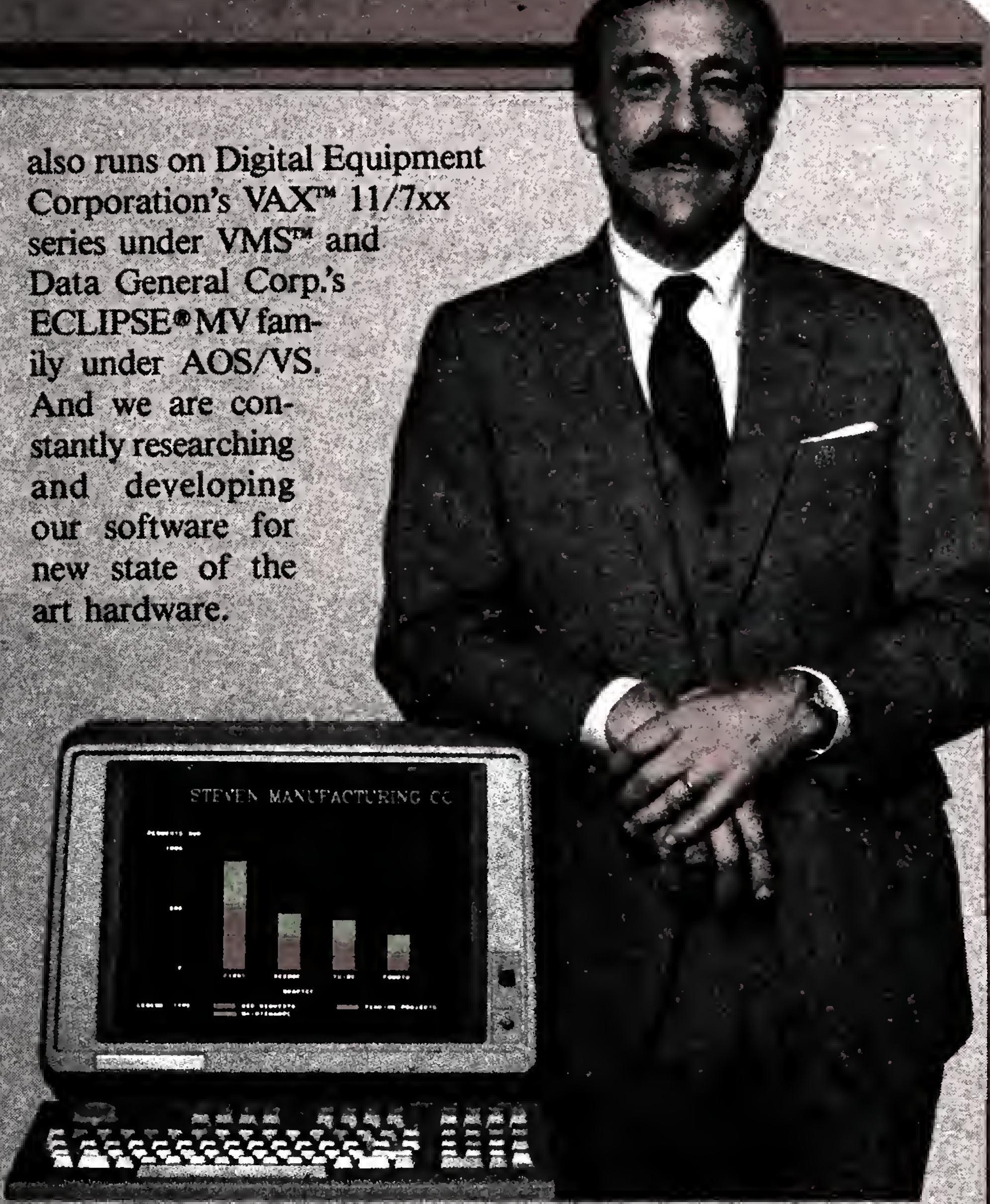

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Are systems people particularly difficult to manage?

I don't think so. I've managed financial auditors and systems folks and some other types. The idea that systems people are different somehow is a bit of a myth. They are creative people and some can be difficult, but that's true in any field. It may have been more that way in years past than now, more prima donnas years ago than today.

Are there some very unique individuals? — yes.

What methodologies are used in systems development to get these unique, as well as more "average," people working together?

We use a form of traditional life-cycle methodology. We don't do anything particularly unique. We try to stress that it is a guideline and not a bible. You have to be careful with methodologies that you don't make them so rigid that people follow methodologies down the primrose path. The systems business is changing; we need to be more flexible about our methodologies.

On a $5,000 personal computer, you don't do a $75,000 requirements study to determine what you want to put on it. You just don't do that. You have to learn how to balance those things. That's not easy to do. The methodology is important. You've still got a document, you still have to follow a process. We try to do that. In each of the operating companies, we have some form of methodology; sometimes it's very structured.

What would you advise a systems person 25 or 30 years old about how to aim for your job?

That's a good question. I wish I knew the answer.

Do you wish you had that advice 20 years ago?

Well, I guess I set out to do more or less what I'm doing. It was my goal to continue to manage in this area, perhaps to do more general management. For a long time, I wanted to be a manager in some form or another. I think you have to have a variety of exposure and experience. You have to learn to communicate, learn to work with people — that's one of the critical variables if you want my job, because my job is meeting with people, coordinating and communicating at multiple levels.

Can someone really learn to communicate like that?

That's the "Are leaders born or made" question, I suppose. My view would be that you can learn, you can make your skills better, become a better communicator. You can't fake it. If you don't like people, that's going to come out. If you really want to work in the backroom and never see a human being, then you ought to be a systems programmer and put in operating systems. If someone has those kinds of characteristics, then they probably don't want or shouldn't want my job. That's a small percentage of the systems population.

Do most of your technical people want to rise to managerial positions?

Probably the majority would prefer to rise to a managerial position rather than to a senior technical guru. We do have a technical ladder. We're trying to make it stronger and better. It's not quite where I would like it to be yet.

What's at the top of the ladder?

We call it a "senior technical consultant." It's a grade-level equivalent to a manager who would report, if not to me, at least to the person who reports to me. We think we can get him another notch or two higher with a little effort.

Is that a recognition that there needs to be a way of keeping technical people happy and doing what they like?

That's right. I don't know what percentage, whether 60-40 or whatever, that would rather be generalist than technical. But there are some who just don't want to be managers. And we have to accommodate them to keep the talent.

You said one of your goals might be to move into general management. Does such a position exist within Arco where an information systems person can move?

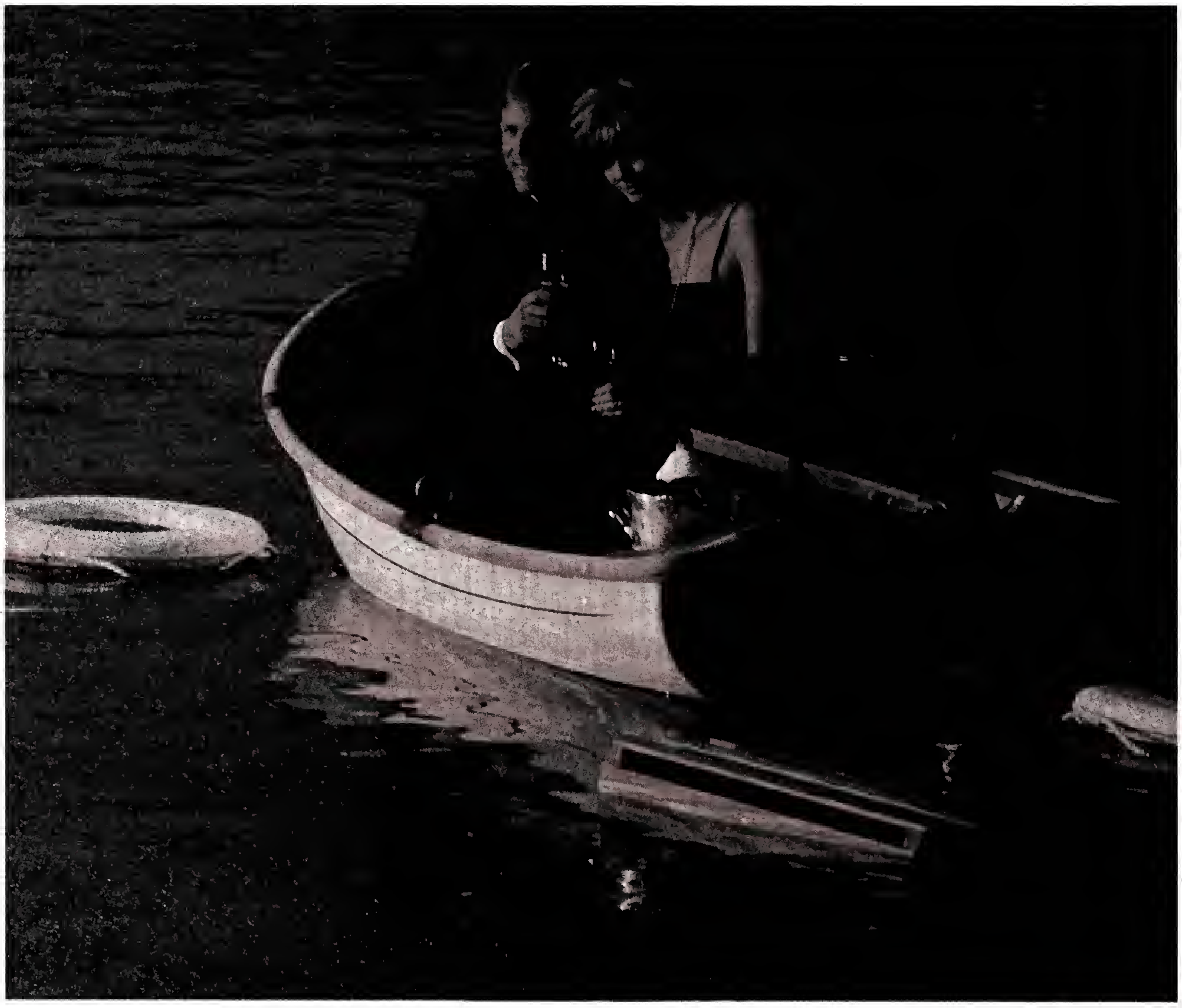
We have had people move out to the finance area or general management, so there is some precedent. It is not widespread. Different companies have different primary paths. For a company like us, it tends to be the engineering side of the house.

Does data processing still have to shake the backroom image here?

I think in general that's true, and I suppose there is some of that here. In most large corporations, there is some truth in that. If you look at banking, it tends to have less of a backroom image than perhaps an oil or manufacturing company might have. That's very dependent on the company, function and business.

Is there a chief information officer at Arco?

No, there isn't. Probably the closest is the function my boss has — he's the vice-president of Administrative Services for the corporate group and also has the interface to the operating companies. I believe in the concept and think we'll probably evolve to it.



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IN DEPTH

IMAGE PROCESSING COMES TO THE OFFICE

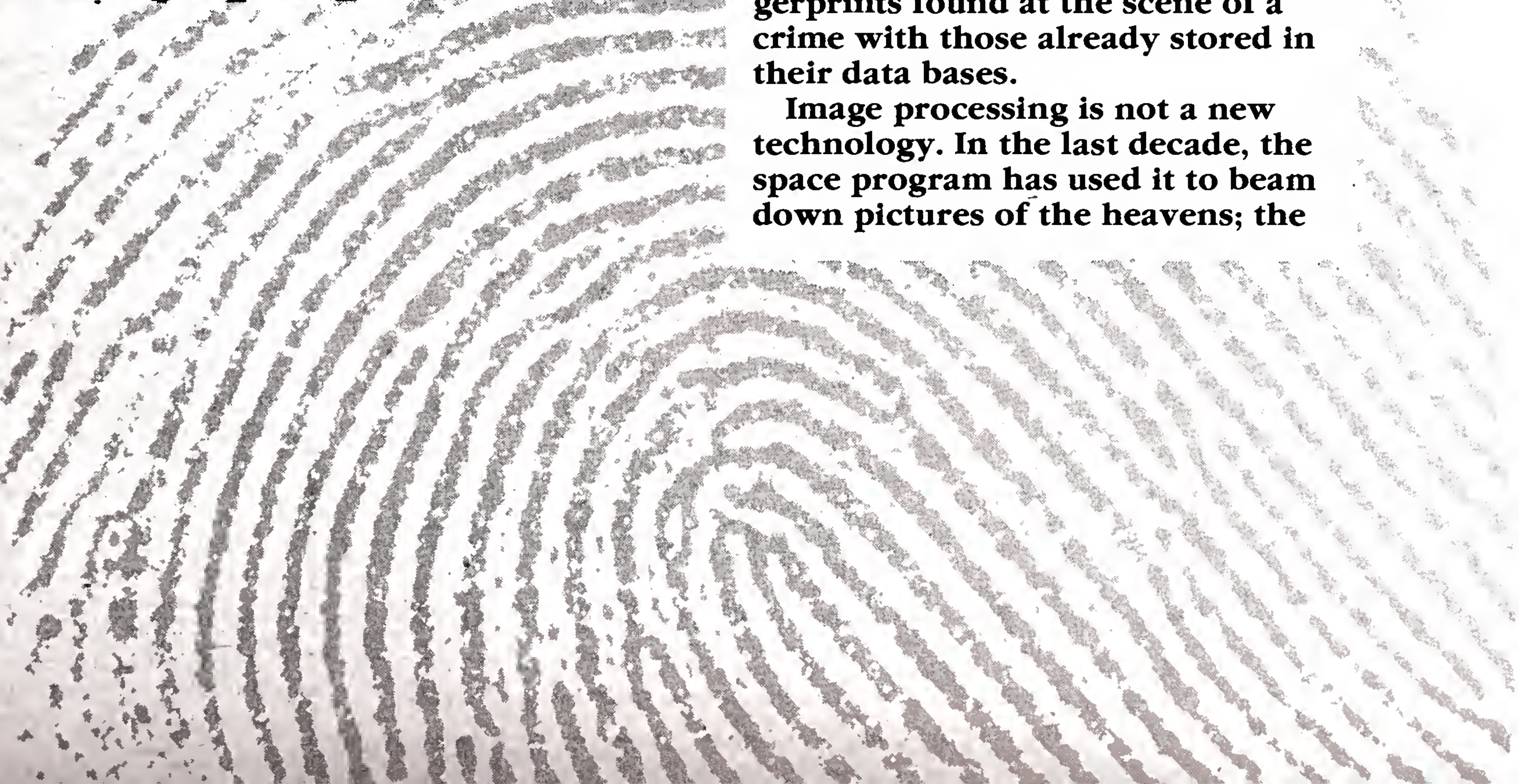
By Elias Safdie

Image processing allows the user to capture, maintain, manipulate and distribute pictorial information in the same way as classical word processing and DP files.

The paperless office has proved elusive. Documents generated on a word processor can be corrected so easily that users may completely reprint a five-page memo to correct a spelling error on the first page, thus generating more paper rather than less.

A technology new to the office, however, could cut back the use of paper. Image processing — the digitizing of photographs, pictures and other pictorial material — will allow banks to verify signatures, insurance companies to process handwritten applications and law enforcement agencies to match fingerprints found at the scene of a crime with those already stored in their data bases.

Image processing is not a new technology. In the last decade, the space program has used it to beam down pictures of the heavens; the



military has used satellite-based image processing equipment for intelligence gathering; manufacturing systems use image processing for automatic fault detection.

Today, image processing is entering the office for two reasons: There is a need for it, and image processing equipment has gotten much less expensive because of advances in semiconductor technology.

Commercial market

Some image processing systems are available now in the commercial marketplace. In the next 12 months, users will begin to see more sophisticated systems with great potential for easing office operations. Generally, the most popular of these systems will be multifunctional rather than dedicated and will consist of a minicomputer, large magnetic disk files, high-resolution terminals, scanners and printers.

> ”
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> *Besides allowing users to incorporate pictorial information in office documents, image processing allows users to manage this information electronically.*

Because pictures convey more information more quickly and accurately than do words, it is especially important to use pictorial information in daily communications with colleagues and customers.

Consider the case of a sales proposal in which a system configuration must be described. It is much easier to simply insert a picture of the configuration (see Figure 1) than to attempt to describe all the pieces of equipment and their interrelationships.

Besides allowing users to incorporate pictorial information in office documents, image processing allows users to manage this information electronically. If one looks at a typical office environment, one sees a large number of documents that include pictorial information — signatures, logos, line drawings and handwritten notes.

As a result, most offices today maintain two sets of files. One set is electronic and holds word processing documents, spreadsheets, data base information and any other information that can be entered through a workstation keyboard. The other set of files is paper, because there has not been a mechanism for capturing and maintaining the pictorial information.

Image processing, however, would allow the user to employ minicomputer-based technologies to capture, maintain and distribute this nontextual information in the same manner as the classical word processing and DP files.

From an office perspective, image processing deals with the use of computer technology to acquire, manipulate, file and distribute pictorial information. Images can be obtained and entered into a computer system to generate an image. Once an image is digitized or generated, image processing allows the user to manipulate it.

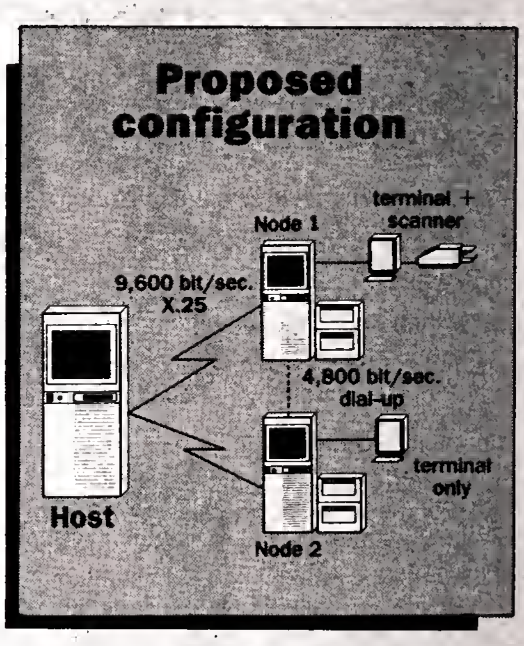


Figure 1

Users can manipulate an image by cropping it — removing unwanted portions to change the orientation —and zooming (blowing up) or shrinking the image to do page make-up.

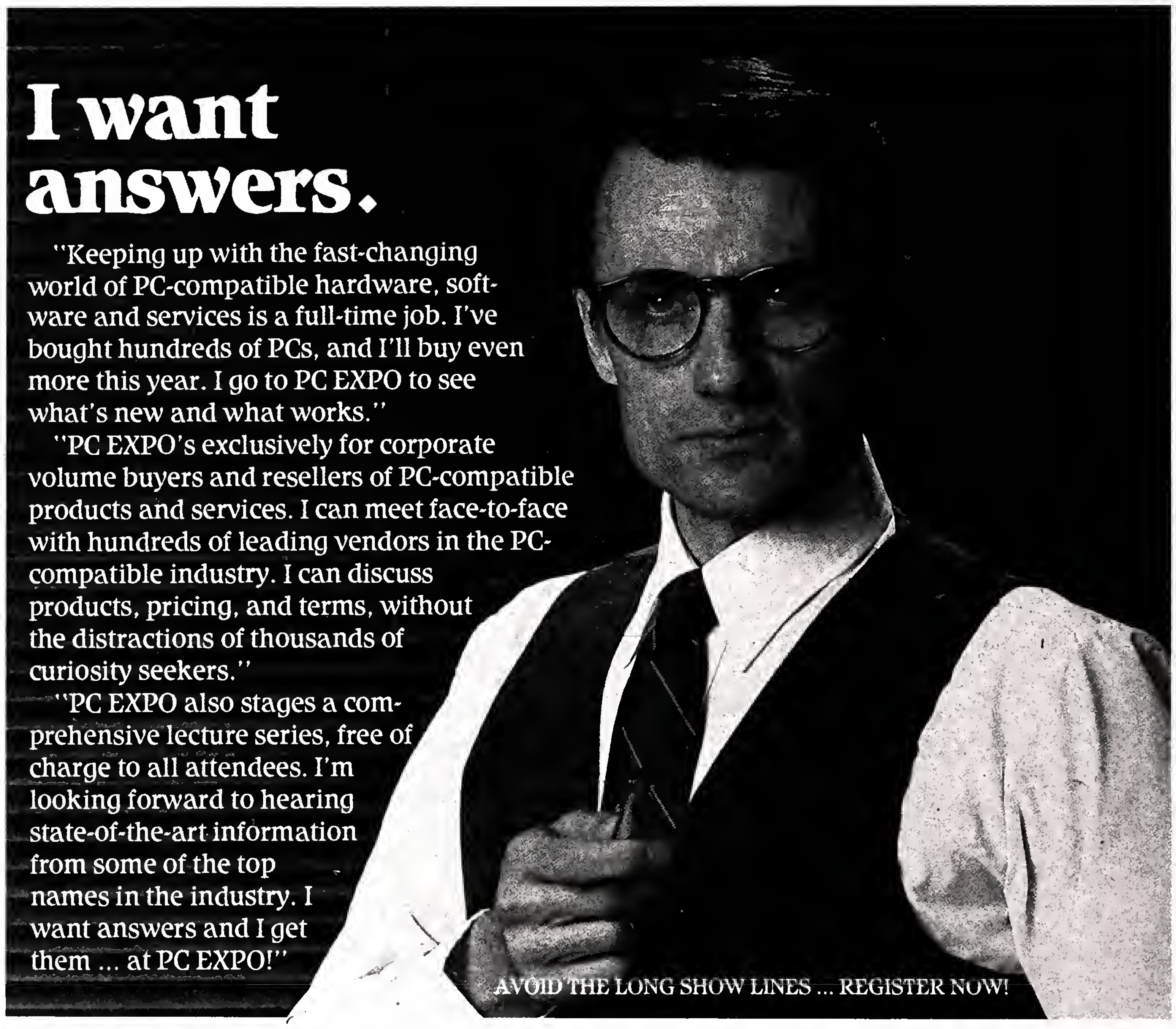
The zoom and shrink capabilities are especially important because they put the user in control of the document. Without these two capabilities, the user is constrained by the original size of the image. With them, the user can make the picture the desired size, place it in the desired location and combine it with text to convey a message.

Storage and retrieval

Storage and retrieval techniques are of paramount importance in the document management applications. With image processing, it is now possible to view images as a response to a data base query.

A real estate customer, for example, might want to see all the homes that are available in a certain district, in a particular price range and of a particular architecture. A data base containing all this information can be coupled with pictures of the homes and their floor plans, and within minutes the customer could see — without leaving the realtor's office — which homes are available that meet his search criteria.

Admittedly, one of the costlier aspects of image processing is the amount of data generated by the process. Figure 2 on ID/14 shows the relationship between resolution and number of bytes required to represent the image.



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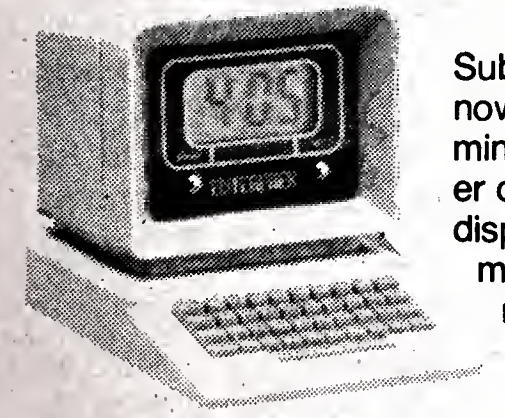

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Semiconductor manufacturers are now working on a compression chip that will meet the Consultative Committee on International Telephone and Telegraph Group IV standard for facsimile compression. This compression scheme is expected to yield faster, greater compression ratios on the order of 12:1 and better. This will make disk storage and telecommunication of images much more affordable than they are today, in some cases cutting those costs in half.

Distributing the image

The combination of minicomputer and image processing technologies allows the images that were digitized or generated to be electronically transmitted to remote sites.

For example, if a real estate broker does not have a house listed that suits a customer's needs but the realtor is part of a multiple listing service or belongs to a firm with several branch offices, he can search the branch offices' data bases.

The information within those data bases, including pictures of the homes they contain, can be transmitted to the real estate broker.

In essence, image processing in combination with telecommunications allows the user enhanced facsimile services — enhanced because the documents can be filed and retrieved at will and because minicomputer and telecommunications technologies offer better error detection and correction capabilities that help ensure the fidelity of the received image.

Two primary justifications exist for the use of image processing in the office: compound document applications and document management applications.

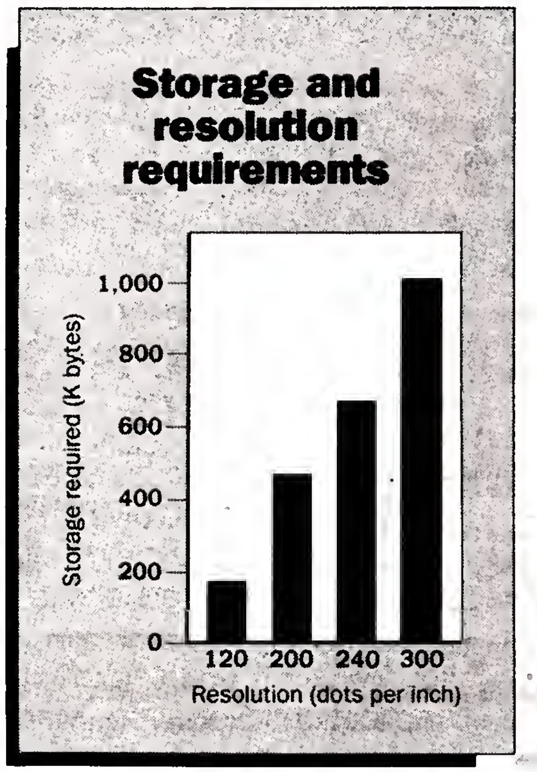
Storage and resolution requirements

Figure 2

Compound documents integrate data, text and image information. These include, for example, sales proposals, which typically have illustrations of equipment or process flows; manufacturing change notices; engineering documentation; service manuals; and in-house training documents. In this class of applications, the objective is to use the image to convey information more efficiently.

When it comes to document management, classical transaction processing involves the storage and retrieval of data and/or text. Image-based transaction processing adds the dimension of pictorial information to classical transaction processing systems.

As mentioned earlier, many applications today involve two sets of files: an electronic file, which deals with alphanumeric information, and a set of paper files, which store the nontextual information. Banks, for example, have electronic files for account information and paper files for customer signatures. A bank using image processing, however, would not need the paper files to store customer signatures.

Why in the office?

Once a file is stored electroncially, the user can enjoy a number of secondary advantages, among them the virtual elimination of the problems associated with manual filing. Users can employ the data base management facilities of minicomputer technology for rapid, accurate retrieval of the information. In the case of the bank, the signature could be accessed by keying in the customer's passbook number.

As a further example, consider an office that processes handwritten orders. There is often a need to refer to the original order, even after the data has been keyed in. Image processing would allow the user to go back to the source document either directly or by querying a data base if the user was unsure of the specific document required — no more lost files or misplaced files and no time lost in finding or re-creating the source document.

Example of benefits

Insurance companies provide a good example of the benefits to be derived from combining image processing with telecommunications. Studies have shown that the longer it takes to generate a policy from the time the application is submitted, the greater the likelihood that the customer will refuse the policy.

> ”
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> *Image processing in combination with telecommunications allows the user enhanced facsimile services.*

It therefore becomes important to minimize the time it takes to underwrite and generate a policy from a source document. Image processing can be used to eliminate two costly delays: mailing applications to central offices for underwriting and mailing back a completed application, including authorizing signatures. Such a use of image processing directly and dramatically affects a business's bottom line by promoting faster, more efficient and more exact communications among office workers.

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How image processing works

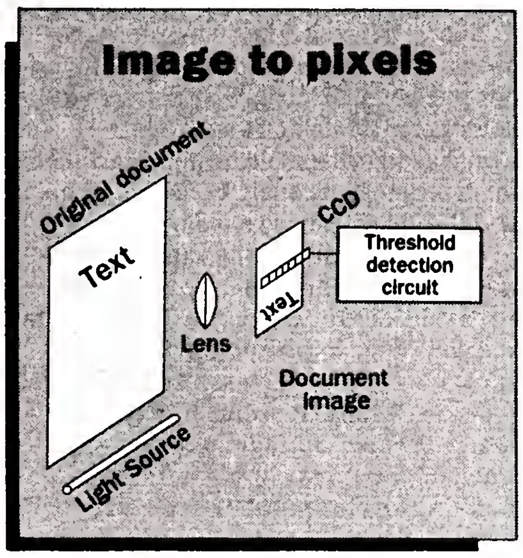
Images can be obtained and entered into the image processing system either by capturing an existing image or by generating an image using the system itself.

An already-existing image is captured by means of a digitizing camera, also known as a scanner. Most scanners on the market today use charge-coupled device (CCD) technology. Charge-coupled devices are light-sensitive semiconductors that generate electric charges in proportion to the intensity of light incident upon them.

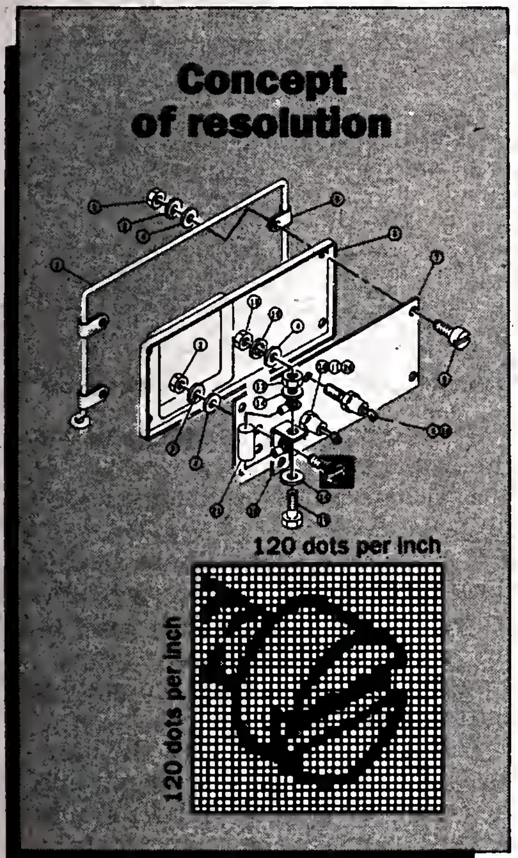
The figure at right shows how the charge-coupled device is used to convert the image to pixels. A light source illuminates the source document. The reflected light is projected via a set of lenses onto a linear array of charge-coupled devices.

Each charge-coupled device is responsible for measuring the reflected light from a small area of the page. If there is no ink on that particular area, there is a lot of reflected light, which in turn causes the device to generate a large charge.

If there is ink on that area, the ink absorbs the light, causing little light to be incident on the charge-coupled device, which in turn will cause a smaller charge to be formed. The charge on each device is then measured to determine whether to illuminate a pixel on the video screen.



The result is shown in the figure below. The number of individual charge-coupled devices and the area that each one views together comprise the concept of resolution, or granularity of the resulting image.



As an example, if the desired resolution is 120 dot/in., one would need 1,020 charge-coupled device elements for an 8½-in.-wide document. Rather than replicating the 1,020 elements vertically as well, multiple scans are used. For an 11-in. document at 120 dot/in. resolution, it takes 1,320 scans to capture the entire document.

Generating images involves using the system to draw lines, circles, arcs and other geometric functions to create images. Font generation capabilities are also useful to annotate the images that are generated or captured. Often it is necessary to start with a digitized image (a logo, for example), add some machine-generated images to it and annotate the composite image with multiple fonts before inserting it into a document. Once the image is generated, the user can begin to manipulate it.

". . . Cathy Ray Tube. Is that your real name or are you pulling my leg?"

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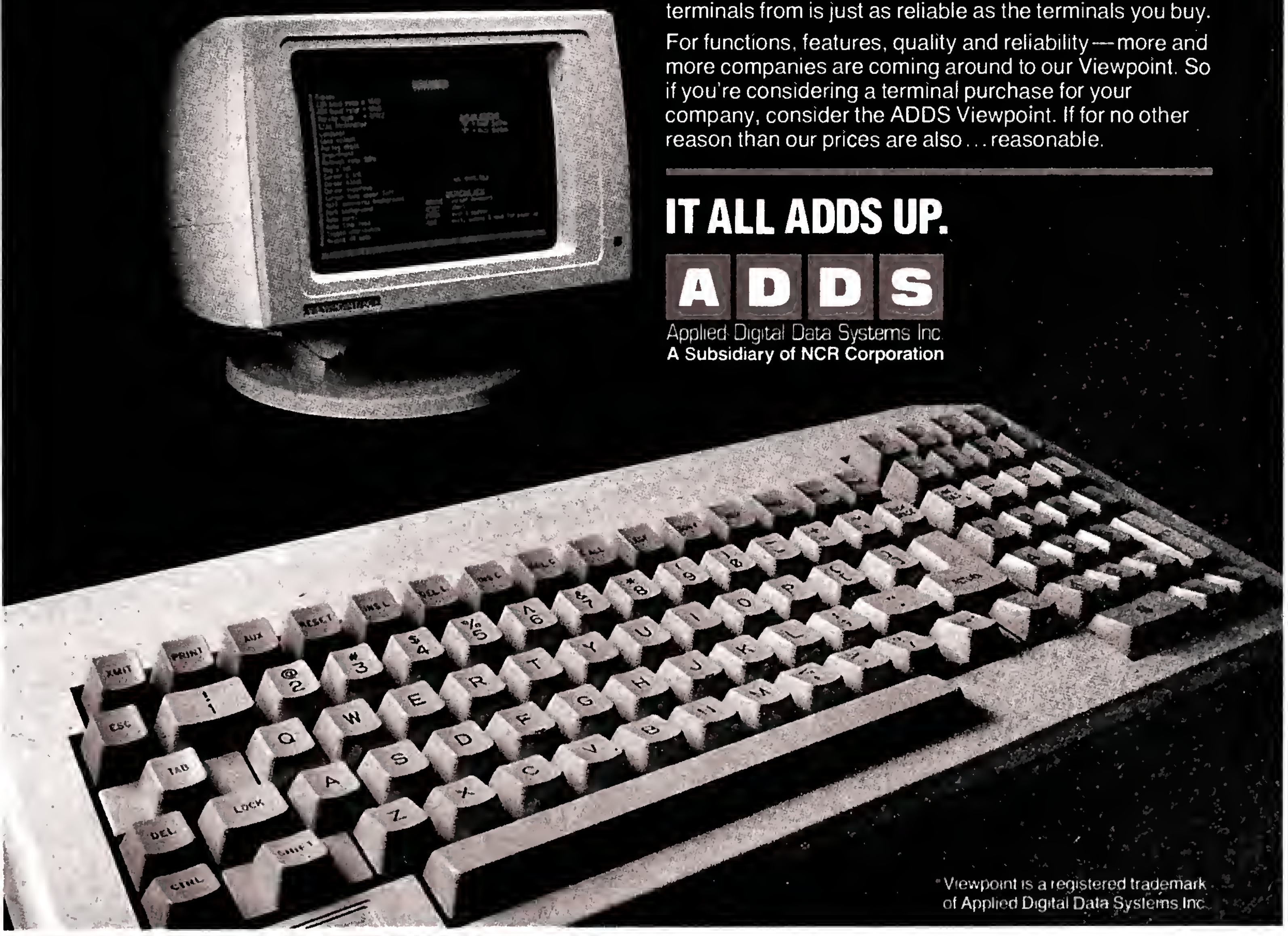

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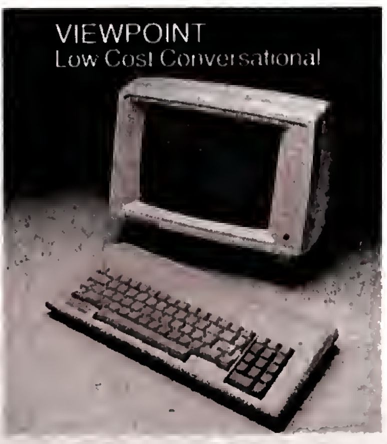

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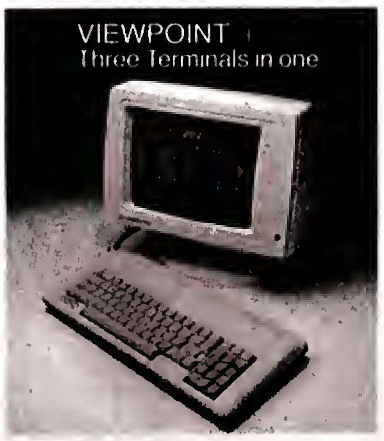

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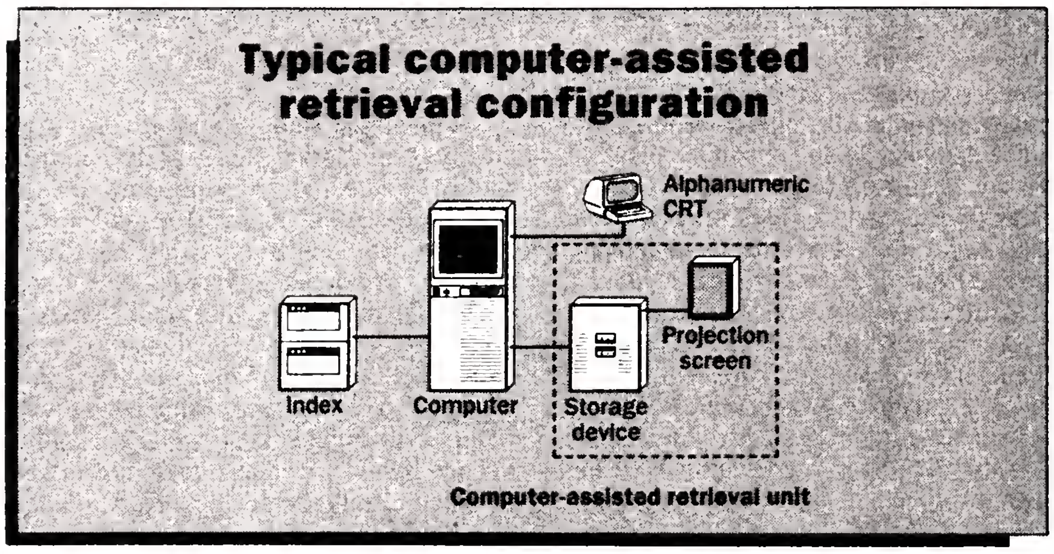
Image processing vs. micrographics


Typical computer-assisted retrieval configuration
Alphanumeric CRT
Index
Computer
Storage device
Projection screen
Computer-assisted retrieval unit

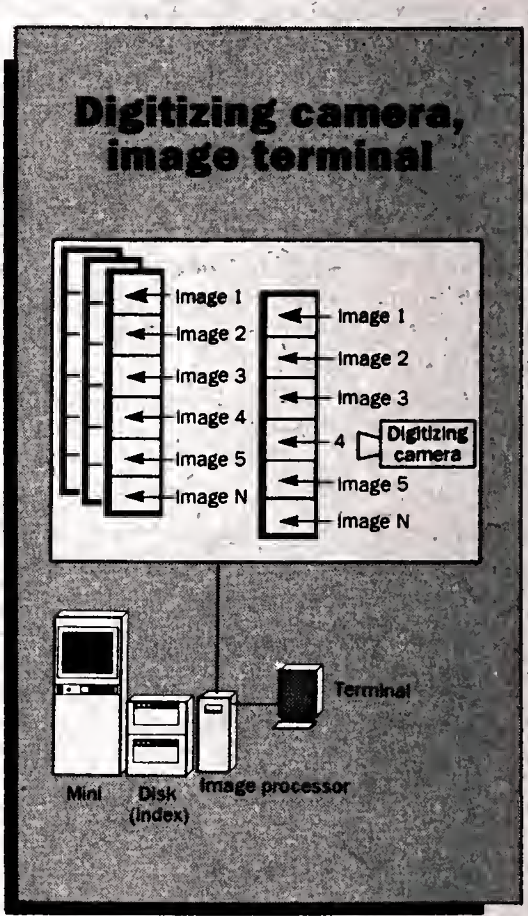
Some offices today use micrographics as a way of dealing with the paper problem. Micrographics is a generic term that includes any film-based optical storage in reduced form, such as microfilm, microfiche and 35mm aperture cards.

Some systems on the market combine the micrographics technology with minicomputer data base and file management to produce what are known as computer-assisted retrieval systems. These systems use the minicomputer file management to keep track of the location of each document in the computer-assisted retrieval system. Typically, two viewing screens are required — one for the alphanumeric interaction with the minicomputer ("I would like to see page 25 of the specifications for the lighting fixtures") and one on which the film-based image is displayed (see figure at left).

Other drawbacks

In addition to the need for two screens, there are also several other disadvantages to these systems:

- The user must be at the location of the film-based equipment to view the image.
- Only one user can view the image at a time.



- Hard copy involves expensive photosensitive paper.
- Transmission of documents is not possible.

Users who want to eliminate these disadvantages can replace the film projection mechanism with a digitizing camera and the alphanumeric terminal with an image terminal (see figure above).

The user can still query the data base for a particular document, and the computer-assisted retrieval unit will still retrieve the appropriate film. Instead of being projected onto a viewing screen, the film image will be digitized by a camera inside the unit. The advantages are the following:

- Only one terminal is required for both image viewing and interaction with the filing system.
- Once the image is digitized, multiple users may view the image simultaneously and the unit is free for another user to view another image.
- Users do not have to be at the film unit to view the documents.
- Hard copy is easier and cheaper to produce using dot matrix or nonimpact print technology.
- Documents can be communicated electronically.

About the author

Elias Safdie is responsible for image product marketing within Honeywell, Inc.'s Office Management Systems Division, based in Billerica, Mass. He holds several patents in CRT terminal design.

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MICROCOMPUTERS

Digital Research offers enhanced DOS version

By Eric Bender
CW Staff

MONTEREY, Calif. — Digital Research, Inc. has released Concurrent DOS 86 Version 4.1, an updated version of its Concurrent DOS operating system that supports high-end IBM-compatible machines, Microsoft Corp. MS-DOS 2.1 applications and Digital Research's Graphics Environment Manager (GEM) software.

A version of Digital Research's Concurrent PC DOS retail package based on the upgraded operating system is expected to ship today for $149. The software reportedly will permit microcomputers built around the Intel Corp. 8086 family to run multiple MS-DOS or Digital Research CP/M application programs simultaneously. Applications may take the full screen or run within windows, according to Digital Research.

In Fortune 1,000 companies, concurrency will prove particularly useful in acquiring large data bases, handling communications tasks and printing, said Michael Loftus, Digital Research's systems software marketing manager.

Multiuser operations reportedly also are supported, with up to four applications running on the system terminal and two additional serial terminals each running one application.

The operating system includes a character-based file manager aimed at helping users find their way among directories. Users can employ standard MS-DOS commands or load GEM applications if they want a graphics-based interface, Loftus said.

The DR Talk communications package, a card-file data base manager, a screen

See **DOS** page 49

Gem Draw receives praise for 'Macintosh-like' traits

By Kathleen Sullivan
CW West Coast Bureau

NEW YORK — In interviews with a group of early users, Gem Draw, a graphics package released by Digital Research, Inc. last month, gathered kudos for bringing "Macintosh-like" capabilities to the IBM Personal Computer.

"Gem Draw is what every Personal Computer lover would want if they have ever looked with envy at the [Apple Computer, Inc.] Macintosh and its graphics software and said, 'I wish I could do that on my Personal Computer,' " said Robert Kalipetes, an assistant vice-president in Citibank NA's New York office.

Kalipetes, who has been using Gem Draw to produce system flowcharts for Citibank, said he has tried other graphics packages. But none of them have measured up to Gem Draw, he said. Kalipetes said he even preferred Gem Draw over a program designed specifically for creating flowcharts.

Unlike the flowchart program, which gives users a limited number of sizes of flowchart symbols, Gem Draw allows users to create objects of any size, Kalipetes said.

Ben Knutson, a software design engineer in the engineering technology organization at Boeing Aerospace Co. in Seattle has been using Gem Draw to create charts for design review presentations. Recently, Knutson used Gem Draw to create a chart showing a network of personal computers for a U.S. Navy contract.

"I drew pictures of the terminals and showed how they would be networked together with a block diagram," Knutson said. "I was able to show exactly what the

See **GEM** page 49

SMALL TALK
Eric Bender
CW Senior Editor

Will DP join in AI parade?

Will many DP shops sit and watch the artificial intelligence parade march by and then begin a long and costly scramble to try and lead the parade — just as they did with minicomputers, word processors and personal computers?

Many people in the AI community say yes.

Data processing often "is deeply embedded and has a great deal of momentum and inertia," said Chet Rindfuss, an instructor in computing at Boeing Computer Services Co. in Seattle. AI proponents are "suddenly trotting into the corporation and saying, 'OK, guys, we have something that really works — where are the big bucks?' " he said.

If they don't get it from DP, they'll simply go elsewhere, he suggested.

Of two dozen major AI projects completed or under way at Arthur D. Little, Inc. (ADL) in Cambridge, Mass., "DP is intimately involved in only one," commented ADL consultant Dennis Barlow.

At some ADL clients headquarters, groups working with AI-based tools have their own box on the corporate organizational chart. "This is not so generic as word processing," Barlow noted, but it does promise large strategic advantages in many industries.

Large AI programs require massive computing resources, of course.

"A 3,000-rule system will grind to a halt except on the largest machines," another expert pointed out.

One prominent mainframe natural-language program "dims the lights when you run it," one MIS manager joked.

But as microcomputers become more powerful, and better low-end AI tools

See **AI** page 49

- ■ Sorcim/IUS Micro Software enhanced the Easyplus windowing environment and introduced an Easyplus network version/**38**
- ■ Unlimited Processing introduced an applications management software package that runs on 3Com and Novell local-area networks/**42**
- ■ Data Decisions announced a report on microcomputer communications products/**46**

INSIDE

Software/**46**

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Sorcim Easyplus gets upgrade, net version

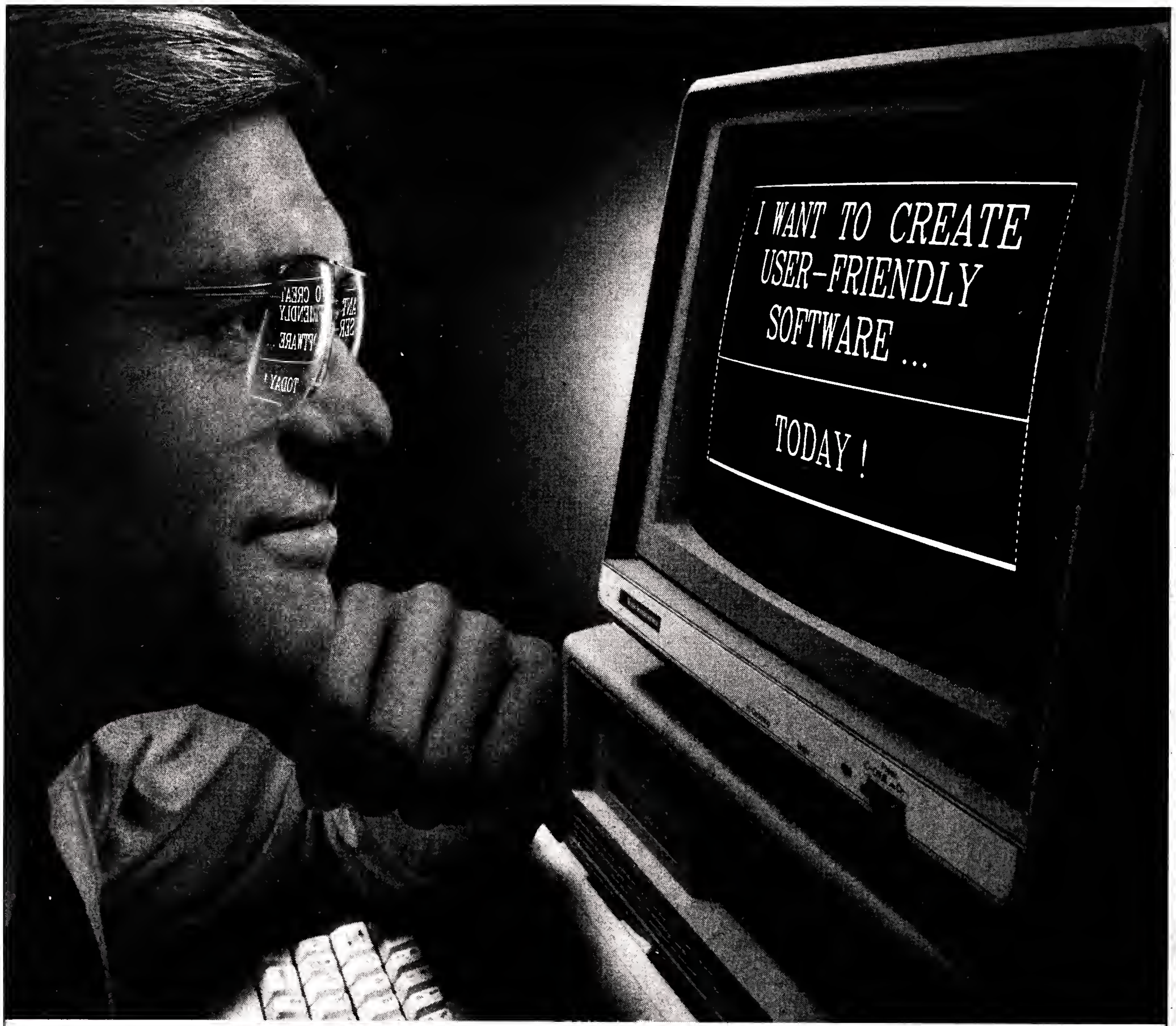
SAN JOSE, Calif. — Sorcim/IUS Micro Software has enhanced Easyplus, a windowing environment that runs on an IBM Personal Computer, and announced Easyplus Network Manager, an Easyplus version that runs on 3Com Corp. local-area networks.

Easyplus 1.1 supplies up to 10 windows and enables a user to load a number of IBM Personal Computer packages into memory at one time and move from one application to another, according to Sorcim/IUS. The windows can occupy a full screen, overlap or be placed side by side. A user can transfer data between any two windows, and each window has its own Help facility. The product features Easykeys, which are 10 user-defined command keys that store up to 20 keystrokes. Easyplus can send output to a screen, printer, DOS file or any combination simultaneously.

Easyplus Network Manager features file- and record-locking capabilities and supplies password protection for each application. Easyplus runs on a Personal Computer with 256K bytes of random-access memory and IBM's PC-DOS 2.0.

Easyplus costs $149. A four-user version of Easyplus Network Manager sells for $395, and an eight-user version costs $595.

Sorcim/IUS is located at 2195 Fortune Drive, San Jose, Calif. 95131.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2774-70

AST offers adapter for IBM AT

IRVINE, Calif. — AST Research, Inc. has introduced an adapter board that allows an IBM Personal Computer AT running the PC Xenix operating system to support up to four users or devices.

The AST Fourport/XN adapter includes Xenix device driver software that is said to tell the operating system how to communicate with the AST board. The device driver can simultaneously support two boards, each with four ports, according to the vendor.

The board includes a diagnostic capability that reportedly will ensure that terminals and other peripherals connected to the Personal Computer AT are configured correctly. The diagnostic program can interactively request information from users to determine the proper setting for each port, the vendor said.

The AST Fourport/XN costs $495, including four RS-232 ports, the Xenix drivers and an installation utility.

AST Research is located at 2121 Alton Ave., Irvine, Calif. 92714.

Apricot micro bows

FREMONT, Calif. — Apricot, Inc. has introduced a $995 personal computer running the Microsoft Corp. MS-DOS operating system and reportedly offering 512K bytes of memory and a single, 720K-byte, 3½-in. diskette drive.

The Apricot F1 reportedly includes the Digital Research, Inc. GEM Desktop graphics interface, an icon-based user interface, infrared keyboard and mouse and color graphics capability. The machine can be linked with up to 32 other Apricot computers under the Apricot Point 32 network. The Apricot F1 is said to use the Intel Corp. 8086 microprocessor and will be available in June.

Apricot is located at 47173 Benicia St., Fremont, Calif. 94538.

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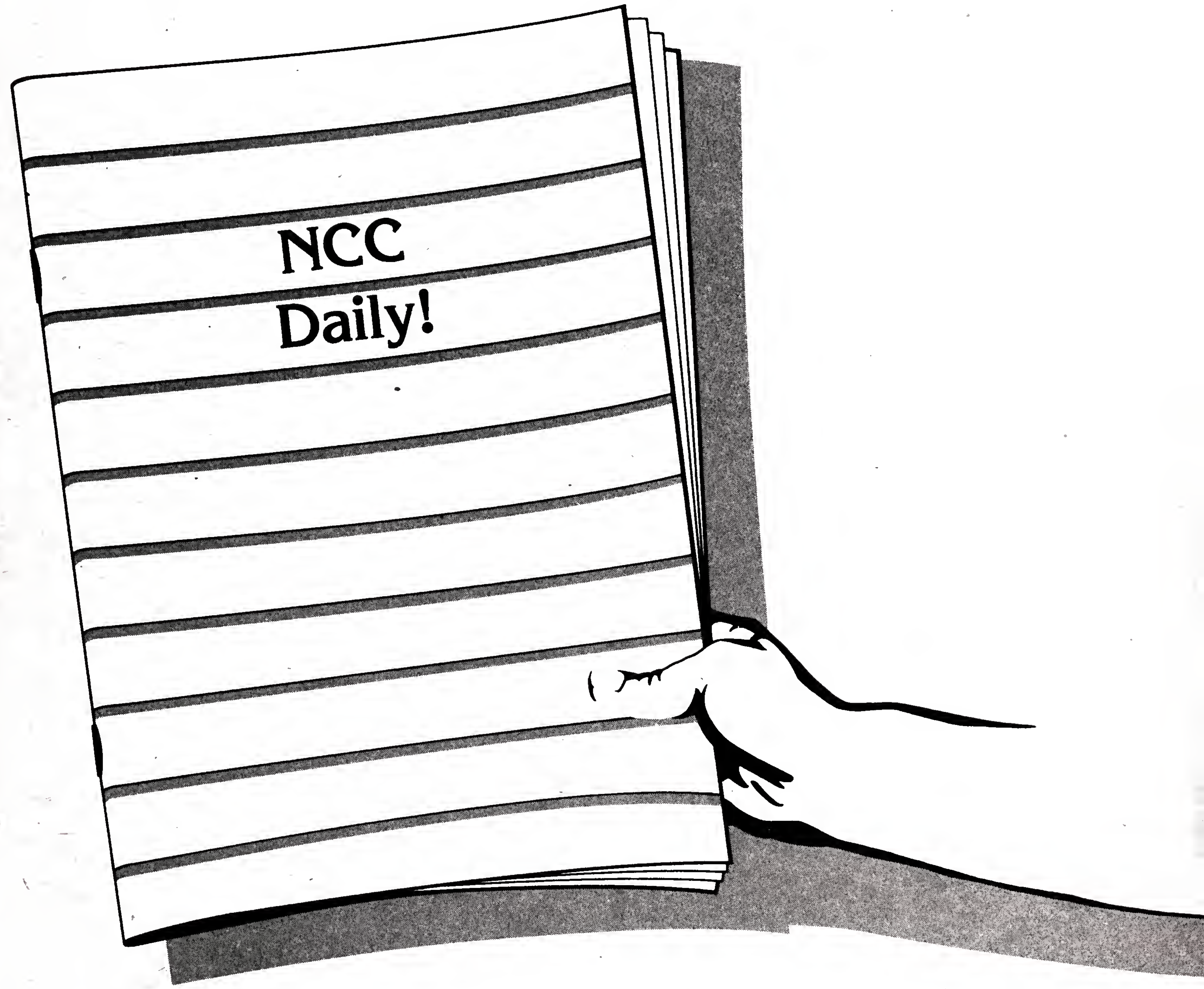
Announcing the NCC tour guide



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Each issue is sure to be well read. We'll provide attendees with on-the-spot coverage of the major product announcements, speeches, and technical programs. Interviews with top industry personalities. A schedule of events for the day of issue *and* the next day. Plus a guide by local experts to Chicago's restaurants, museums, and entertainment.

We'll also cover NCC in three special issues of Computerworld. The July 8th Preview issue. The July 15th Show issue. And the July 22nd Wrap-Up issue. Advertise in these issues and ensure your investment in NCC. And, just as importantly, you'll keep your name in front of more than 687,000 computer-involved professionals all during this eventful period.

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NCC Preview	July 8	June 21
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Touchscreen II allows you to choose from over 600 of the most popular business software packages ■ In addition, you can use Hewlett-Packard's own software library ■

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Most of these packages are enhanced through the use of touch and soft keys, which execute complex commands in one stroke ■ This not only speeds the operation of *Touchscreen II,* it speeds the learning process required to use it.

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Touchscreen II requires minimal orientation, even for the beginning user ■ This is largely due to an ingenious system called Personal Applications Manager, or PAM.

PAM displays program applications as English-language labels ■ These labels when touched or activated through soft keys, get you into programs immediately.

PAM also enables you to accomplish a number of common jobs—such as switching from pc to terminal mode—with a single keystroke.

Touchscreen II is easily set up for peripherals like printers and plotters, thanks to the pictorial menu ■ Simply touch the pictures that match the devices in your system.

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HEWLETT PACKARD

Team-Up offers manager for network applications

JACKSONVILLE, Fla. — Unlimited Processing, Inc. has unveiled Total Environment for Application Management from Unlimited Processing (Team-Up), an applications management package that runs on 3Com Corp. and Novell, Inc. local-area networks.

The product supports up to 32,000 applications, containing as many as 700,000 files, and tracks file existence, file names, server and file locations and user access authorization, the vendor said.

Team-Up also supplies application generation capabilities that enable a user to create data entry screens by entering information on a screen.

Team-Up reportedly enables a user to read, write, enter, update and delete records referenced in up to 255 data bases by pressing a single key. The package maintains free record space and index files so a user does not have to reindex or sort files.

A single-user version of Team-Up costs $795, and a multiuser version of the program for an unlimited number of users sells for $1,795.

Unlimited Processing is located in Suite 8, 8382 Baymeadows Road, Jacksonville, Fla. 32216.

Natural Microsystems adds telemarketing software

NATICK, Mass. — Natural Microsystems Corp. has introduced a voice information system software package that reportedly adds voice-based telemarketing capabilities to IBM Personal Computers or compatibles with 256K bytes of memory and a Winchester disk drive.

Watson Voice Information System (VIS) is used with Natural Microsystems' Watson integrated voice and data system. Watson converts voice signals into information that can be stored on a computer disk. The computer is then able to access voice files in the same method it accesses computerized data, according to the vendor.

Watson VIS allows companies to define a level of information that the caller can access by pressing a button on a Touch-Tone phone. The product can also be used to dial lists of phone numbers and conduct a dialogue for those who press Touch-Tone responses. Users can load up to 500 phone numbers from the disk to the Watson outgoing call file, a spokesman said.

The voice information system costs $298.

Natural Microsystems is located at 6 Mercer Road, Natick, Mass. 01760.

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Dataflex out for computers under Xenix

MIAMI — Data Access Corp. has released a version of its Dataflex Application Development Data Base for the IBM Personal Computer AT under PC Xenix and on the Molecular Computer Model 12 system under Xenix.

Dataflex, which costs $1,250, is an application development and relational data base management system. Applications created with Dataflex are said to support up to 250 data files with more than 16 million records per file.

The product reportedly includes command language for program development, applications generators for data entry screens and reports, a compiler and a multifile interactive query for creating reports, labels and data files from data base information.

The package requires a minimum of 384K bytes of memory.

More information can be obtained from Data Access, 8525 S.W. 129th Terrace, Miami, Fla. 33156.

Datran unveils modem card

LOS ANGELES — Datran Corp. has announced a Modem Accelerator card for the IBM Personal Computer, Personal Computer XT and AT that reportedly improves telecommunications speed.

The Modem Accelerator is said to be compatible with most modems and software capable of sending binary files. The product compresses English-language text and other Ascii data to allow files to be stored in less disk space, the vendor said.

The card is also said to function as a spelling checker, processing 500 word/sec., with a dictionary of 30,000 words and phrases.

The card reportedly compresses data at 20,000 bit/sec. and decompresses data at 50,000 bit/sec.

The card costs $795.

Datran is located at 10519 Lauriston Ave., Los Angeles, Calif. 90064.

SPECIAL REPORT

DBMS

In the June 24th Computerworld Special Report we'll examine Data Base Management Systems (DBMS). This will include discussions of: market trends; corporate uses for microcomputer data bases; the increased use of multiple data bases; vendors' efforts to integrate applications around a central DBMS; and various issues concerning the purchase and maintenance of corporate data bases — such as corporate data base security, and how to evaluate and select a DBMS.

Fully 79% of Computerworld's subscribers at user organizations are personally involved in purchasing DBMS software for their company.

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Three more firsts from the people who invented the wheel.

Xerox Advantage D-36 Diablo Printer
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XEROX

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And the D-36 spells reliability. It averages 4,000 hours of printing between maintenance calls.

But Xerox didn't stop there. Each of these new machines is compatible with most computers on the market, including the IBM-PC. And they're all easy to use.

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So if you're looking for the latest in daisywheel printing technology, go with the people who've been in the business the longest. Call 1-800-833-2323, ext. 25, your local Xerox office, an authorized Diablo or Xerox dealer or send your business card to Xerox Corporation, Dept. 2501B, P.O. Box 24, Rochester, NY 14692.

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Migent's Ad-Lib applications generator for IBM micros bows

SCOTTSDALE, Ariz. — Migent Software, Inc. has announced it will release Ad-Lib, a $495 applications generator software product that incorporates relational data base management, file management and tables generation features, for IBM microcomputers and compatibles.

The vendor said Ad-Lib uses artificial intelligence techniques to allow end users to develop custom applications without programming because of a proprietary language for forms processing, called Formage, and a Micro Application Painter.

The forms-oriented software enables the user to paint the screen with a customized business form ready for data entry and automatically names and defines the fields.

Examples of applications include general ledger, payroll, amortization schedules, order entry forms, spreadsheets and accounts receivable, the company said.

Ad-Lib runs on the IBM Personal Computer, Personal Computer XT and compatibles with a minimum of 256K bytes of random-access memory. Ad-Lib will be released this summer.

Migent is located at Suite 203, 8300 N. Hayden Road, Scottsdale, Ariz. 85258.

Report evaluates micro communications offerings

CHERRY HILL, N.J. — Data Decisions, Inc. has announced "PC Communications," a three-volume report that covers a number of microcomputer communications products.

The report evaluates hardware and software products, including products that link microcomputers to mainframes, minicomputers, data services and other personal computers.

"PC Communications" is divided into five sections. Product evaluations list product strengths and weaknesses and group products into novice, experienced and technical user categories.

A rating summaries section lists Data Decisions' test results of similar products. The technical reports section examines and discusses issues such as security measures and vendor strategies.

The product profiles section groups similar products. The last section is a directory of vendors of micro communications products.

The report will be updated each month. A one-year subscription costs $800.

Data Decisions is located at 20 Brace Road, Cherry Hill, N.J. 08034.

SOFTWARE

■ **Autodesk, Inc. has announced Version 2.1 of its Autocad drafting package, which runs under Microsoft Corp.'s MS-DOS and IBM's PC-DOS operating systems.**

Version 2.1 features an increase in execution speed of up to 40%, optimized plotting of drawing and support for dot matrix and laser printers.

The visualization capability included in Advanced Drafting Extensions 3 (ADE 3) is a step toward providing three-dimensional capability for Autocad, a spokesman said.

Wire-frame drawings can be viewed and plotted and lines obscured by other objects in a 3-D drawing can be visually suppressed from displays and plots to provide a realistic 3-D image of solid objects.

ADE 3 also contains the ability to create and edit polylines — a series of connected-line or arc segments, or a combination of the two, that can have widths or line types associated with it — to provide for constructing, editing and dimensioning of smooth curves.

Autocad Version 2.1 has three configurations: The basic drafting package costs $1,000; Autocad with ADE 2 costs $2,000; and Autocad with ADE 2 and ADE 3 costs $2,500.

Autodesk, 2320 Marinship Way, Sausalito, Calif. 94965.

■ **Dialogic Corp. has announced the Dialogic Voice Toolbox, a set of software tools that allows systems developers to create end-user voice systems for the IBM Personal Computer, Personal Computer XT and AT.**

The Voice Toolbox consists of five modules. Vbase allows users to create, edit and manage a data base of words and phrases, Callstat monitors phone line status, Dialogic Intelligent Modem Emulator (Dime) can emulate Hayes Microcomputer Products, Inc. modems and Dostools can create an applications package using voice I/O. Sptools signal processing routines that allow the user to condition signals on a voice file.

Dime and Callstat require Dialogic's Dialog/2 and Dialog/3 voice systems. The entire Voice Toolbox is priced at $150. Individual modules cost $50 each.

Dialogic, 60 Baldwin Road, Parsippany, N.J., 07054.

See **SOFTWARE** page 47

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SOFTWARE from page 46

■ **Lattice, Inc. has announced software that reportedly allows C language programmers to take advantage of the IBM Topview multitasking window environment.**

The Lattice Topview Toolbasket is said to be a library of more than 70 C functions to control window, cursor and pointer operations. It also reportedly includes printer control, cut-and-paste and debugging functions.

The product requires a minimum of 256K bytes of memory (with 512K bytes recommended) on the IBM Personal Computer, Personal Computer XT and AT.

Lattice Topview Toolbasket is priced at $250, and source code is available for an additional $250.

Lattice, P.O. Box 3072, Glen Ellyn, Ill. 60138.

■ **Modern Technologies International, Inc. has introduced a menu driver, file directory manager, file router and IBM PC-DOS interface utility for the IBM Personal Computer XT, AT and compatibles.**

The package, Hard Desk, reportedly provides the user with a set of English commands that can be addressed by function keys to integrate up to 10 software packages in a single menu system. The product requires 4K bytes of random-access memory and can access programs that reside in a combination of directories through a single menu. Function keys provide access to PC-DOS, on-line Help facilities, file routing and batch commands.

Hard Desk can be used with a number of applications packages, including Micropro International Corp.'s Wordstar, Microsoft Corp.'s Multiplan and Lotus Development Corp.'s 1-2-3. Hard Desk costs $95.

Modern Technologies International, Suite 302, 656 Bair Island Road, Redwood City, Calif. 94063.

■ **Softool Corp. has announced that its Fortran Programming Environment (FPE) is now available on the IBM Personal Computer, Personal Computer XT, AT and compatibles.**

Formerly available only on minicomputers and mainframes, FPE's programmer productivity tools include structured languages, a source code documenter, interface documenter, error detectors, libraries of prefabricated code, testing aides, tracing aids, optimizers and communications software. Called FPE/PC, it is said to enable programmers to compose portions of an application program from existing code and automates Fortran programming tasks.

FPE/PC allows the user to move Fortran applications from a mini or mainframe to the micro for development of micro applications and to off-load Fortran development work from a mainframe or mini to a micro.

FPT/PC is priced at $1,495.

Softool, 340 S. Kellogg Ave., Goleta, Calif. 93117. .

■ **Thoughtware, Inc. has announced a knowledge-based software package said to help managers to manage people effectively.**

The Management Advantage package runs on the IBM Personal Computer, Personal Computer XT, AT and compatibles. It is said to contain advice distilled from practical management experience.

Management Advantage requires a minimum of 256K bytes of memory and IBM's PC-DOS 2.0 or higher.

The package costs $249.

Thoughtware, Suite 10000A, 2699 S. Bayshore Drive, Coconut Grove, Fla. 33133.

■ **Aurotech, Inc. has released an integrated security package for the Lotus Development Corp. 1-2-3 spreadsheet product running on IBM's Personal Computer, Personal Computer XT and AT.**

The package, Sheetguard, is said to permit only authorized users to share the 1-2-3 data.

Sheetguard is said to be activated whenever 1-2-3 is in operation. The program uses Aurotech's proprietary encryption method to scramble the data as it is being saved. The spreadsheet is retrieved by using a password.

The program costs $79.95.

Aurotech, Suite 100, 925 S. Niagara, Denver, Colo. 80224.

■ **Fox & Geller, Inc. released its Quickindex indexing software for users of Ashton-Tate's Dbase II and Dbase III packages on IBM Personal Computers and compatible systems.**

Quickindex is said to produce Dbase-compatible index files up to 10 times faster than Dbase does. A 2,000-record data base with a key size of 10 can be indexed in 1½ minutes, the vendor said.

The package costs $69 for a copy-protected version and $99 for a non-protected version.

Fox & Geller, 604 Market St., Elmwood Park, N.J. 07407.

■ **The MacNeal-Schwendler Corp. has unwrapped an upgrade to its finite element analysis software package for the IBM Personal Computer XT, AT and compatibles.**

The MSC/Pal2 package is designed for use by mechanical engineers and designers in small and medium-size companies, the vendor said. It is an upgraded version of MSC/Pal that runs on the IBM Personal Computer.

The package adds elements including quadrilateral plates, shear panels and curved beams to mechanical systems. Other functions include additional applied load capabilities, enhanced graphics and the ability to handle larger, more accurate three-dimensional models, the vendor said.

Features include automatic nodal

Continued on page 48

folks. So you can forget about publishing reams of short memos. Its voice prompts guide you step by step. So there's no chance for miscommunication. Problems are solved. Decisions are moved along.

It works wonders with most any business telephone system. It'll cater to forty folks or a thousand — simply, swiftly, cost-effectively.

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Continued from page 47

resequencing, multiple-loading subcases, cylindrical and spherical coordinate systems and generation commands for handling element, node point and boundary condition.

The MSC/Pal2 package runs under IBM's PC-DOS 2.0 or higher and requires 512K bytes of memory, a floppy drive and a hard disk, a color graphics controller and a math coprocessor, the vendor said.

The package costs $1,995 and will be available in July.

MacNeal-Schwendler, 815 Colorado Blvd., Los Angeles, Calif. 90041.

■ **Micro Data Base Systems, Inc. has announced a version of Knowledgeman, its integrated package, that runs on Novell, Inc.'s local-area network.**

Knowledgeman's functions include a relational data base management package, a spreadsheet and a programming language. Optional modules include forms painting, graphics, text processing, report generator and support for a mouse.

The local-area network product version features protection of shared records or tables, automatic hold processing when a user is browsing through a table and automatic index updating for shared tables.

Other functions are automatic suspension and resumption of shared table modifications, choice between shared and local status for each table and the ability to modify a completed table's status and limit user Read or Write access of specific tables. Password security and data encryption are supported.

A 10-user version of the product costs $1,495.

Micro Data Base Systems, P.O. Box 248, Lafayette, Ind. 47902.

■ **Enertronics Research, Inc. has announced a version of Energraphics, a graphics package that runs on Texas Instruments, Inc.'s Professional microcomputer.**

The package reportedly works with nine fonts and produces pie charts, line charts and three-dimensional bar charts. A pie chart can be sliced into 15 portions, and the software can list each portion's percentage of the whole and can enlarge a portion. Line charts feature up to 10 lines per chart, up to 200 data points per line, scatter graphs, curve fitting, log scaling and up to four Y scales. Bar charts support up to 24 data ranges, 10 graphs per chart and horizontal or vertical plotting.

The package enables a user to define up to 2,280 symbols and store and recall them with one keystroke. It can input files from Lotus Development Corp.'s 1-2-3, Microsoft Corp.'s Multiplan and other packages that use Data Interchange Format files.

Energraphics costs $350. Plotter drivers are available for an additional $100.

Enertronics Research, Suite 207, 150 N. Meramec St., St. Louis, Mo. 63105.

■ **PC Software Interest Group has announced Edit, a public domain word processing package that runs on an IBM Personal Computer.**

With the package, a user can move a cursor by character, word, line, sentence, paragraph, screen or indentation. The product supports block saving, moving, insertion and deletion. Edit provides search forward or backward, global search and replace and conditional replace functions.

A user can set tabs, margins, page layout, headers, footers, page numbers, justification and spacing. Edit supplies Help screens that explain different options.

The product runs on an IBM Personal Computer with 128K bytes of random-access memory and IBM's PC-DOS 2.0 operating system.

Suggested donation for Edit is $25.

PC Software Interest Group, Suite J, 1030 E. Duane Road, Sunnyvale, Calif. 94086.

■ **Software Research Associates has announced a version of its program testing software for Microfocus Ltd. Cobol programs written on the IBM Personal Computer.**

Test Coverage Analysis Tool (Tcat/Cobol) is said to help the programmer identify which parts of the code remain untested.

Tcat/Cobol reportedly consists of a Cobol language instrumenter, a run-time program to collect test coverage data and write trace files and a coverage analyzer that produces the coverage numbers. The software also includes utilities for manipulation of trace files, a trace file archiving facility and on-line Help frames.

Tcat/Cobol requires an IBM Personal Computer running PC-DOS 2.0 or later and 64K bytes of memory.

The software costs $2,500 for a single CPU license and $9,000 for a license for all machines at one site.

Software Research Associates, 580 Market St., San Francisco, Calif. 94126.

■ **Wordtech Systems, Inc. has unveiled a compiler that reportedly converts programs written in Ashton-Tate Dbase III to code that can run on any micro using Microsoft Corp. MS-DOS with 192K bytes of random-access memory (RAM).**

Db III Compiler reportedly compiles programs written in the Dbase III language into a form that will execute without either Dbase III or Ashton-Tate's Runtime. The compiled program is said to be compatible with both Dbase II and Dbase III data files.

The product is said to eliminate the Dbase III system requirements for an IBM Personal Computer with 256K bytes of RAM.

Db III Compiler costs $750. The upgrade cost from Wordtech Db Compiler for Dbase III is $250.

Wordtech Systems, P.O. Box 1747, Orinda, Calif. 94563.

COMPAQ could have stopped here

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GEM

from page 37

network would look like."

Knutson said it is easy to find graphics packages for producing pie charts and bar charts but difficult to find programs that allow users to merge text and graphics. "That's what was so great about Apple's Macintosh and Lisa computers," said Knutson, who has also used the Lisa to produce charts.

Knutson said he "jumped at the chance to use Gem Draw" when it was introduced. Now, he recommends the program to fellow workers, he said.

Knutson likes the immediate feedback of Gem Draw, he said. Instead of having to wait for several weeks while a Boeing graphics group produced hand-drawn charts, Knutson can now create his own.

Equally important, he said, is the fact that the charts can be easily altered with Gem Draw. "And if you've ever worked with engineers, you know they like to make changes," he said jokingly.

Virginia Martin, a staff engineer in the data systems division at Hughes Aircraft Co. in Fullerton, Calif., said she wanted to be able to provide users with the same graphics capabilities as the Macintosh without buying Apple's computer. Hughes Aircraft has already settled on the IBM Personal Computer as its standard system, she said.

In addition, the company wanted a package that would work with IBM's enhanced graphics board and monochrome monitors. "We didn't want to have to replace all our monitors with color monitors," she explained. Gem Draw, she found, fit the firm's requirements.

Bert Trerise, a senior scientist in Hughes Aircraft's data systems division, is using Gem Draw to produce view graphs for overhead presentations. In general, he gave the package a positive review, saying it produced satisfactory graphics on his dot matrix printer. But the program does have some shortcomings, he said.

Trerise said he has encountered problems in trying to center a block of text within a box. Although the text will appear centered on the screen, it is not centered when it is printed out, he said. "It's a hit-or-miss process," Trerise said. "And I haven't figured out a rule of thumb that would let me get close the first time," he added.

According to a Digital Research spokesman, users will be able to center text within a box if they are working in the Portrait (vertical) mode. In Landscape (horizontal) mode, however, users will have to experiment with the output to gauge the center of the box.

Despite this problem, Trerise said he would encourage others to try Gem Draw. "In my usage, the fonts it produces on the printer are clear, just right for view graphs," he said.

As a whole, the users gave Digital Research high marks for Gem Draw's menu-driven installation procedure. No knowledge of IBM PC-DOS commands is required to install the program, they said.

The users had some suggestions for improving Gem Draw. Citibank's Kalipetes said he would like Digital Research to provide a set of flowchart symbols with the program. In addition, the users recommended that the firm increase the variety of fonts and provide the ability to rotate objects.

AI

from page 37

(such as Lisp and Prolog compilers) become available, personal computers are becoming subversive once again. They're beginning to join the AI parade as prototyping, development, delivery and training vehicles.

In one of the first steps, micros built around the Intel Corp. 80286 or Motorola, Inc. 68000 family may be perfectly appropriate for building and running small knowledge-based systems.

And, as in the case of early micro software packages, those knowledge-based systems will not necessarily be written by computer professionals.

Neil Pessall, an advisory scientist with Westinghouse Research and Development in Pittsburgh, has written several expert systems in conjunction with another materials specialist, using Texas Instruments, Inc.'s Personal Consultant software.

That approach "is a violation of the AI field," he acknowledged. But it has worked well, and he disagrees entirely with the theory that "expert systems should not be developed by experts."

DOS

from page 37

editor and a print manager also are bundled in with the operating system.

Additionally, Digital Research is offering OEM versions of Concurrent DOS 86, which include local-area networking support provided by the company's DR Net. Digital Research intends to provide IBM PC Network compatibility by the year's end, Loftus said.

Concurrent DOS 86's multitasking design is said to feature a flexible, priority-driven architecture rather than a time-sliced CPU setup such as that provided by IBM's Topview operating environment. The software takes up 165K bytes of internal memory.

Concurrent PC DOS will be repriced at $295 in August, Digital Research said.

The product runs on the IBM Personal Computer, Personal Computer XT, Personal Computer AT and compatible systems. The software requires a minimum of 256K bytes of memory and two floppy disk drives; 512K bytes and a hard disk drive are recommended.

More information is available from Digital Research at Box DRI, 60 Garden Court, Monterey, Calif. 93942.

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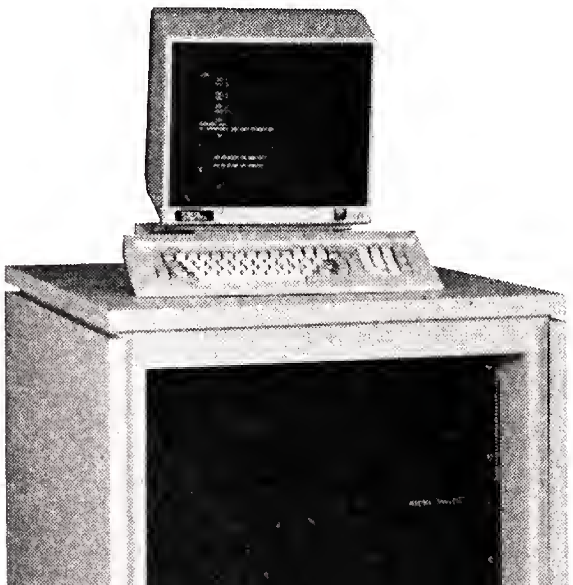

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COMMUNICATIONS

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Numbers add to net hassles

Anyone who has been frustrated by trying to bring up a new data line that does not work on the first try is aware of the resultant finger-pointing that occurs between the systems people, the modem supplier and the carrier. Multivendor networks and AT&T divestiture have made it much harder to pin the blame on one particular vendor.

For example, follow a byte of information leaving an IBM front-end processor through a T-Bar, Inc. matrix switch, which feeds an AT&T Information Systems modem connected to a Nynex Corp. line via an Arus Corp. bridge, to AT&T Communications long-haul facilities employing Rockwell International Corp. digital microwave equipment. From here, the byte travels to the Pacific Bell area, where a Paradyne Corp. modem-sharing unit is connected to a modem supporting an ADP Network Services, Inc. controller that emulates an IBM 3274 communications controller to support terminals from GTE Corp.'s Financial Services Division and Teletype Corp. printers.

This is not an academic concoction; it is a typical business network.

It is amazing that such a complex machine would work at all, but it does. The credit for this end-to-end compatibility goes to the integrity of the communications industry as a whole. But the communications manager is increasingly confronted with the challenging responsibility of making sure this multidimensional conundrum is reliable.

Network complexity can grow arithmetically and geometrically. As an example of the former, net complexity can

See **MINOLI** page 55

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

Network upgrades seen laying ground for ISDN

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — As a precursor to universal voice/data connectivity, the seven regional holding companies are rapidly installing metropolitan fiber-optic local loops and upgrading analog central office switches to digital.

The migration to these facilities is seen by analysts as preparation for Integrated Services Digital Network (ISDN), where customers will control their access to telephone utility for data, voice and image communications.

In 1984, the seven regional holding companies spent an average of $2 billion for basic network service improvements and have indicated plans to spend another $1 billion in 1985 in further network expansions and upgrades. Central to the telephone companies' strategies is keeping the largest revenue-producing customers on their networks and blocking any move to bypass.

In recent weeks, Bell Atlantic Corp., Nynex Corp., Ameritech and Bell South Corp. have all made announcements of services they call "links in the evolution to an ISDN." Some of these services are new features for its Centrex service.

Nynex, for example, recently introduced a family of Pathways services that will become available by the end of 1985 [CW, May 13]. Pathways includes Flexpath, a digital 1.5M bit/sec. or 64K bit/sec.

See **NETWORK** page 56

Salary gains trail budgets

By Paul Korzeniowski
CW Staff

DALLAS — Salaries of communications professionals are not keeping pace with the more rapid increases in corporate communications budgets.

Communications managers interviewed here recently at Telecom '85, a show sponsored by the International Communications Association, reported that equipment and service costs were fueling budget increases but salaries were remaining stable or increasing at a much slower rate.

Managers said their budgets had grown 10% to 30% in each of the last two years. Equipment purchases were listed as the primary stimulant for budget increases.

Regarding salary increases, a communications manager at an insurance company in Bloomington, Ill., said his budget went up 30%, but salaries increased by 10%. The insurance company's salary increases were the highest mention by managers in-

See **SALARY** page 55

Nynex to build net for DEC

WHITE PLAINS, N.Y. — Nynex Business Information Systems Co. will build two fiber-optic networks for Digital Equipment Corp. in Massachusetts and New Hampshire to link 21 DEC offices.

Nynex reported that retaining DEC as a corporate customer was one of the key factors in the decision to offer the minicomputer maker an alternative to the network capabilities of the Nynex telephone companies.

The networks will span 80 miles, link DEC voice switches and provide high-bandwidth data transmission facilities. The 90M bit/sec. backbone network has a purchase value of $4.6 million and will include fiber-optic cable, terminating hardware and lightwave equipment.

The first phase of the project should be completed in two years, according to the company.

Nynex Business Information Systems is located on the Second Floor, 65 W. Red Oak Lane, White Plains, N.Y. 10604.

- ■ Data Switch has announced a new model in its family of fiber-optic channel extenders that can reach up to 5 km/**54**
- ■ AT&T has announced a digital, switched videoconferencing system for local, metropolitan-area networks/**54**

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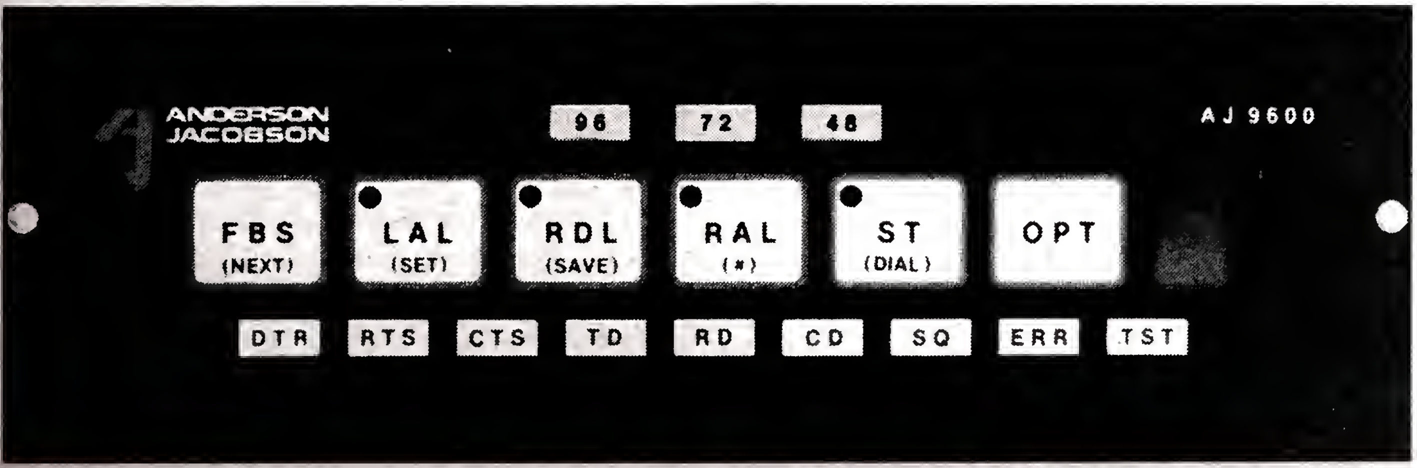

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AT&T's Vivid video teleconferencing system debuts

BERKELEY HEIGHTS, N.J. — AT&T has announced a digital switched video conferencing system for local, metropolitan-area networks.

The Vivid video teleconferencing system is said to offer broadcast-quality video service under customer control, enabling users to initate a video conference without operator assistance.

Vivid is said to provide voice communications and support data transmission at rates from 1,200 to 56K bit/sec., the vendor reported. Vivid will be provided over 200,000 miles of AT&T lightwave cable available in a number of locations throughout the U.S., although exact locations have not yet been disclosed.

The Vivid system includes the following:

- Digital Video Terminal, a coder/decoder that accepts video and analog data, such as facsimile and encodes, multiplexes and transmits the data in a DS3 signal at 45M bit/sec.
- A wide-band video switch, which is used to establish one-way, two-way, point-to-point or multipoint connections.
- A Customer Network Controller based on an AT&T 3B minicomputer that communicates to the switch and allows a customer to control a network.
- A Digital Switch Interface that converts a DS3 signal to a signal required at a switch.
- A Lightwave Video Interface, which is able to receive DS3 lightwave signals and converts them to electrical signals.
- A touch-sensitive control terminal for access to the video teleconferencing network.

The service should be available in the first quarter of 1986, and pricing is dependent on each installation.

AT&T is located at 1 Oak Way, Berkeley Heights, N.J. 07922.

Data Switch announces extenders

NORWALK, Conn. — Data Switch Corp. has announced a new model in its family of fiber-optic channel extenders.

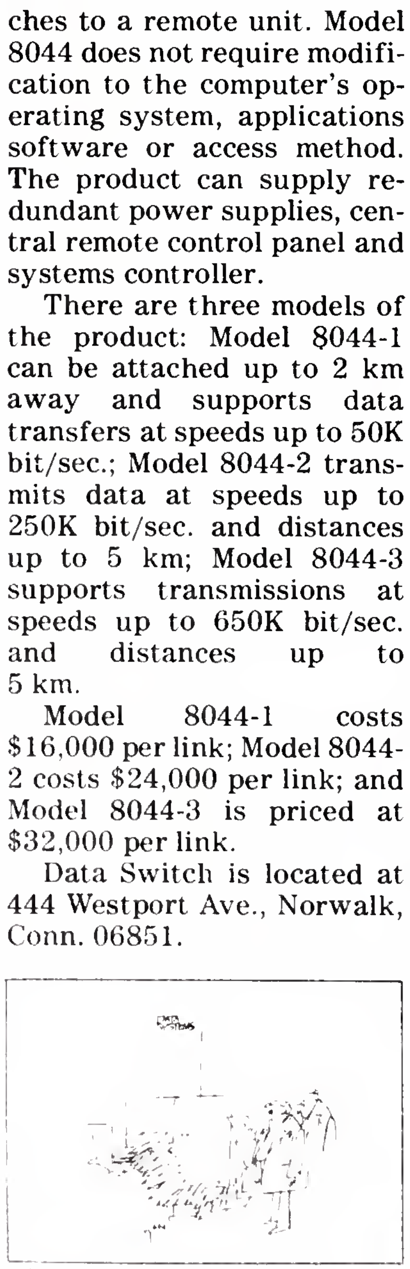
The Model 8044 attaches a peripheral control unit to an IBM mainframe at distances up to 5 km at speeds up to 650K bit/sec. Controllers normally have to be located within 400 ft of one another and transmit data at speeds up to 43K bit/sec., the company reported.

The product consists of two channel extension units: one for a channel on the mainframe and one that attaches to a remote unit. Model 8044 does not require modification to the computer's operating system, applications software or access method. The product can supply redundant power supplies, central remote control panel and systems controller.

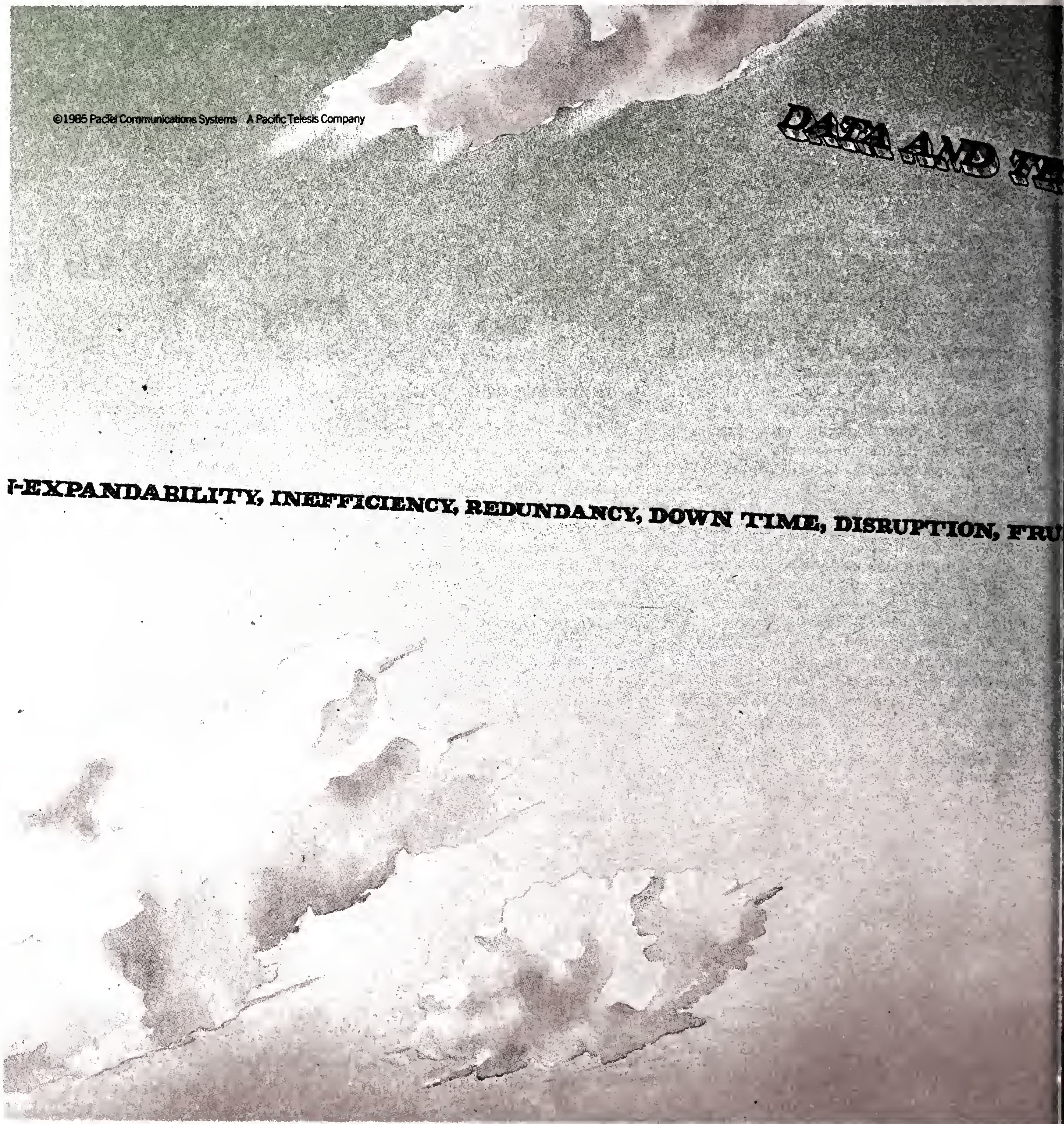
There are three models of the product: Model 8044-1 can be attached up to 2 km away and supports data transfers at speeds up to 50K bit/sec.; Model 8044-2 transmits data at speeds up to 250K bit/sec. and distances up to 5 km; Model 8044-3 supports transmissions at speeds up to 650K bit/sec. and distances up to 5 km.

Model 8044-1 costs $16,000 per link; Model 8044-2 costs $24,000 per link; and Model 8044-3 is priced at $32,000 per link.

Data Switch is located at 444 Westport Ave., Norwalk, Conn. 06851.



"It says, 'Thanks for the memory dump.' "


DATA AND T
I-EXPANDABILITY, INEFFICIENCY, REDUNDANCY, DOWN TIME, DISRUPTION, FRU

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MINOLI

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follow the arithmetic sequence $1n$, $2n$, $3n$ and so on as modems are added to a network to support remote sites. It can also grow geometrically following the sequence, n, n squared, n cubed and so on, when directly addressable memory in a CPU grows with word length: 2^8 addresses, 2^{16} addresses, 2^{32} addresses and so forth.

Competition and divestiture have created an environment that exceeds both arithmetic and geometric complexity. We have been thrust into an exponentially complex world.

For example, there are 64 ways in which three vendors — A, B and C — can point the finger. These include the following: A says nothing, B says nothing, C says nothing; A says nothing, B says nothing, C says it's A's fault; A says nothing, B says it's A's fault, C says it's B's fault; A says it's B's and C's fault, B says it's C's fault, C says it's B's fault; A says it's B and C's fault, B says it's A and C's, C says it's A and B's fault . . .

You get the idea.

Few real-world networks would involve only three vendors. The network outlined at the top of this article specifies 14, and it is not unusual to have 20. In general, if there are n number of vendors, then there are "two to the power n times $(n-1)$" ways to point the finger.

Obviously, multivendor environments existed before divestiture. However, this situation has been aggravated by divestiture insofar that where once a single vendor provided end-to-end long-haul links, that same circuit must now be handled by four vendors: two local telephone companies, the long-haul carrier and the equipment supplier.

Given this, communications managers should strive to minimize the number of vendors involved with their networks. The orthodox (predivestiture) way a communications manager would approach network design would be to acquire the least expensive hardware solution, even if this meant comprising the "vendor-purity principle" by adding another vendor.

Prima facie, it would appear that the manager had done his job in minimizing network cost. In reality, however, the apparent savings would probably soon be lost in the meantime to repair equipment and associated business risks or lost revenue potential due to downtime.

Divestiture, with its intrinsic multivendor character, has accentuated the need to value reliability over apparent savings when implementing networks.

SALARY

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terviewed. "Salaries in my department have only slightly increased," said D. C. Augustin, director of telecommunications and network services at McDonnell Douglas Aerospace Information Services in St. Louis.

"Communications professionals' salaries have not kept pace with the additional skills required for the job," maintained Tony J. Gelardi of Computer Sciences in El Segundo, Calif. "But my department's salary increases have kept in line with those throughout the company."

This situation has created a problem for Gelardi. "There have been occasions where our company has served as a training ground," he said. "As soon as a person was fully trained, he went to work for another firm where he received more money."

Another area where salary levels hinder a manager is in hiring employees. All the managers claimed to have had problems finding communications professionals. "We looked for a new person for one year," explained Dennis E. Fielding, staff consultant at Harris Corp. in Melbourne, Fla. "We finally hired a college graduate who didn't have any experience."

Fielding did not, however, favor substantially increasing salaries to entice potential employees. "A manager can go out and buy an employee," he said, but "I doubt many managers want to get in a bidding war."

McDonnell Douglas' Augustin concluded, "Whenever there is an increasing demand in the market like there is today for telecommunications professionals, staffing can be a problem. Our turnover has been higher than I would like it to be, but there isn't much you can do when there just aren't enough qualified people."

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NETWORK

from page 53

direct I/O dialing link for private branch exchange users. The service is said to enable users to initiate service changes by sending channel signal data to the telephone company's central office digital switch. Touted features include simultaneous voice/data transmission and avoidance of analog or digital conversions.

Other features planned by Nynex include a digitized Centrex enhancement called Intellipath that is initially slated for the cities of Boston and New York, where a concentration of fiber-optic and digital-switch capacity is available.

Feature capabilities

Features will reportedly enable customers to initiate service changes such as the number of direct inward dialing trunks used, automatic route selection, trunk queuing and station moves. Other features will reportedly offer incoming call identification and integrated access with dynamic allocation enabling customer trunk control via computers located at the users' business offices. Nynex also said it will add data communications features such as packet switching and electronic mail.

According to Nynex, these Centrex upgrades "provide customers with ISDN capabilities while permitting them to retain all the Centrex advantages they now enjoy." The upgrades are referred to as the "building blocks to ISDN."

Another planned Nynex service designed to keep the large-volume data communications user loyal to the local telephone company is Switchway. Switchway is a switched, 56K bit/sec. service that will permit businesses to have access to a dedicated private line on an as-needed basis.

Nynex said that it has already completed construction of two fiber-optic circles around Manhattan and one around Boston. Nynex's total lightwave mileage presently has reached 57,000 miles.

University networks

As another example of the migration to ISDN, Bell Atlantic recently announced the installation of Centrex-based local-area networks for two universities. The service is implemented by placing voice/data multiplexers in the customer's office as well as in the telephone company's switch center, avoiding duplication of separate voice and data lines. Data rates are said to range from 9.6K bit/sec. to 19.2K bit/sec.

Bell Atlantic also reported that it spent $1.9 billion in 1984 on local-exchange network and switch upgrades, including 24,000 miles of fiber-optic lines, and plans to spend $2 billion in 1985 on adding 158 digital switches and another 34,000 miles of fiber.

A separate $20 million, 5,800-mile fiber-optic network for Washington, D.C., will be finished this year, which will be linked to a dedicated digital Centrex service for the White House. Bell Atlantic said an additional 41,000 miles of fiber will be laid down in 1986.

Attractiveness of Centrex to fade as choices expand

Despite optimistic views that Centrex enhancements are forerunners of an Integrated Services Digital Network (ISDN) environment, the official view of the Federal Communications Commission, which regulates Centrex as a basic service, is not so rosy.

An FCC official said the commission has tried to maintain an even hand in Centrex regulation, although it could have killed it when AT&T was divested.

The FCC official, who requested anonimity, said that Centrex lines will eventually be charged the full $6 per line per month access charge, just as regular business lines are now being assessed, and added that the attractiveness of the service will not be so apparent.

"We've refrained from killing it because the former Bell companies had so much investment stranded in the service," he said.

Improvements in local loops

The official added that technological improvements in local-loop copper wire and the installation of fiber-optic capacity in cities where Centrex services are predominant could mean that a local loop will not be needed for every main station and would thus avoid the per-line access charge pricing system.

"As the cost of local access increases, fewer customer locations will be able to justify access lines into a private network," according to Perspective Telecommunications Group, a Franklin Lakes, N.J., research outfit. "Many of these locations will simply utilize a mix of public-switched services including Wats, MTS and other long-distance carriers. It is this area where the integration of local lines by ISDN and the resulting cost improvements may be the greatest benefit achieved."

Much of the Centrex development work came out of the AT&T Bell Laboratories facility that is dedicated to Bell Communications Research, which is the research arm of the seven Bell regional holding companies.

In a recent publication, the team leaders behind the Centrex work reported, "The ISDN design is consistent with the overall concept of Centrex, which is based on the switching and computing power of the central office."

— **Bryan Wilkins**

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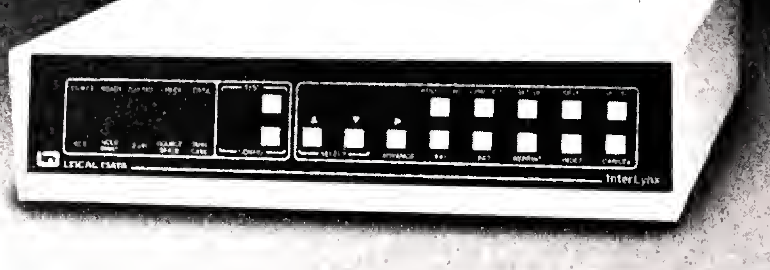

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SYSTEMS & PERIPHERALS

Harris adds Unix-based supermini

MELBOURNE, Fla. — Harris Corp. has unveiled a 32-bit AT&T Unix-based supermini that uses Schottky bit-slice technology and is said to to perform in the 7 to 8 million instructions per second range.

The HCX-7 system is geared to the scientific and engineering user and is Harris' first machine to run Unix as its native operating system. It is priced from $225,000 and features the following:

- AT&T Unix System V, augmented with University of California at Berkeley Version 4.2 extensions.
- A set of 160 instructions pared down from a superset of most used instructions.
- Frequently used instructions — such as Call/Return — implemented in hardware, so that all instructions typically run in one machine cycle of 100 nsec.

A basic HCX-7 includes a CPU, 2M bytes of main memory, a console processor and terminal, an asynchronous controller, power supply and the operating system.

With the addition of 2M bytes of memory, a floating-point processor and an I/O expansion cabinet, the price starts at $275,000. Shipments will begin in July.

More information can be obtained from Harris, Computer Systems Division, 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

Disk drives not cure-all for storage backlogs

By Donna Raimondi
CW Staff

PATCHOGUE, N.Y. — Disk drives are being used as a Band-Aid for inefficient data management among users of IBM and compatible mainframes. Proof of this lies in the fact that in spite of a nearly 400% increase in capacity over the past few years, users are still buying disk drives at a breakneck pace. For example, IBM and IBM-compatible disk drive makers ship a total of roughly 70,000 new disk units each year.

Those were the conclusions of "The IBM Disk Report" prepared by Applied Management Services here, which noted that managers often fail to realize the economical solution to storage backlogs is to store information on existing disk drives more effectively. This can often be accomplished, the report said, by using disk management software packages.

A good disk management software package can help reorganize data fields, help to defer hardware purchases and reduce costly systems programming man-hours, the report said. Such a program can

See **DISK** page 58

CAD/CAM networking debuts

By Clinton Wilder
CW Staff

BEDFORD, Mass. — Computervision Corp. has unveiled a networking capability for its computer-aided design and manufacturing system that reportedly allows single-workstation users to access data from any point in a product design process.

The CDS II system represents the first complete workstation-to-host integration capability from Computervision, according to James R. Berrett, company president and chief executive officer.

CDS II, which will be available in mid-June, is said to allow individual engineers and project managers to access Computervision Cadds 4X and Cambridge Interactive Systems Ltd. Medusa design applications software. Berrett said that software includes approximately 400 applications packages for product design and manufacturing in mechanical, electronic and building construction fields.

Access to the software was previously

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INSIDE

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Terminals/**60**

A new blue suit is nice, but can IBM change its stripes?

HARD TALK
Tom Henkel
CW Senior Editor

When IBM unveiled its long-awaited Sierra line of mainframes in February, it took extra care to emphasize that the 3080 line of mainframes was not a fading product. The dead-even performance of the 3090 Model 200 and the 3084 Model QX and the nearly two-year delivery date for the top-end 3090 Model 400 were intended as unquestionable statements that IBM has no plans to turn its back on hundreds of 3080 users.

Clearly, IBM's immediate reason for keeping the 3080 series alive was to bolster shabby first-quarter (and probably second-quarter) financial results. But the underlying rationale for tossing an olive branch to 3080 users was to keep those top IBM customers happy.

This is the new IBM — the friendly computer company.

IBM has been falling all over itself recently trying to undo what many have perceived as a "we're IBM, who cares what you think" attitude. It seems that in the process of establishing itself as the top computer company in the world, IBM has also gained the reputation of being the most arrogant.

But with changing times has come new IBM leadership. The friendly trend has been steadily evolving since John Opel took over as chief executive officer. Now with John Akers in the top seat, the nice-guy trend appears not only to be continuing but also intensifying.

The new, friendly IBM is not bad. Actually, it is quite nice. IBM seems to be honestly trying to keep users, consultants and even the trade press informed on what is happening behind the hallowed blue walls. There was a time when IBM appeared to consider everything from its sacred product strategy down to the color of the tile in its executive men's rooms a secret. Now you can actually ask IBM a question and sometimes get a reasonable answer.

But there is still some doubt over whether anyone is really buying all this friendliness. People who have been dealing with IBM for

See **NICE** page 59

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* Based on room inventory of Hilton Hotel Corp., which does business in the U.S.A. Source: New York Times article, week of 4/1/85.

TURNKEY SYSTEMS

■ **Data Recording Systems, Inc. has unwrapped its Laserscribe/8415 plain paper printer that can be driven by raster image processors such as those offered by Monotype, Camex, Inc. and Raster Graphics, Inc.**

The 8415 — available only to OEMs — comes standard with software-selectable, dual-density resolutions of 800 by 800 dot/in. and 400 by 400 dot/in. A standard draft mode of 400 by 400 dot/in. is said to print an 8½- by 11-in. page in 4 seconds.

The Laserscribe/8415 costs $30,000 in single quantities at OEM pricing.

Data Recording Systems, 80 Ruland Road, Melville, N.Y. 11747.

■ **Scan-Optics, Inc. has announced the Reliareader 542 for machine reading of characters from full-size paper forms.**

The 542 scanner uses a custom-integrated circuit developed by the vendor. It will be available in five models. One model will recognize characters from 256 templates, while the top model can recognize characters from 1,280 templates. Each template may represent a single character, the vendor said.

The reading subsystem of a Reliareader 542 is capable of speeds up to 2,000 char./sec. using the company's proprietary parallel processors. The custom circuits are said to allow products to be packaged in smaller boxes than allowed by first-generation optical character recognition products.

The Reliareader 542 is said to use programmable recognition logic, which allows users to adjust to a mix of printing devices. The 542 can accommodate the company's Image Capture and Compression Unit, which permits digital images of documents to be captured and compressed while the machine is reading. The subsystem captures images of 8½- by 11-in. pages at a resolution of 200 dot/in. at speeds of up to 200 page/min.

Prices for the Reliareader 542, scheduled for fourth-quarter availability, begin at $350,000.

Scan-Optics, 22 Prestige Park, East Hartford, Conn. 06108.

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range in price from $3,000 to $23,000, and it should provide reports, file maintenance, disaster recovery, standards enforcement and archiving functions.

Increasing corporate demands for information have been raising the pressure on DP executives to provide users with more storage. The demands on DP executives are, in turn, putting more pressure on IBM and the plug-compatible manufacturers (PCM) to provide faster, higher capacity, cheaper, more compact and more flexible storage alternatives.

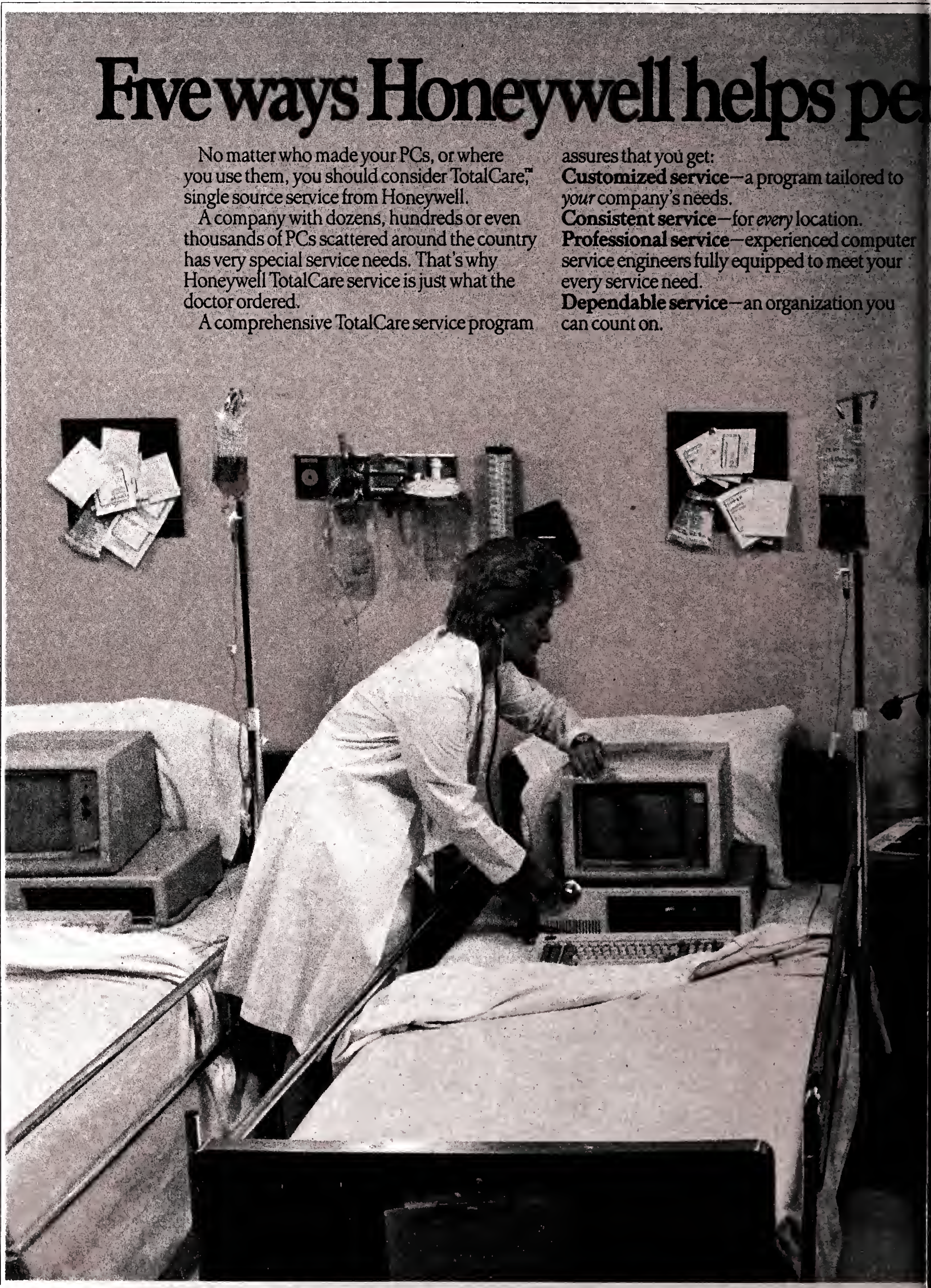
Large users are demanding drives — such as IBM's 3380 extended capability models — that will increase data storage capacity with smaller floor space increase requirements, the study said. Replacing older 3380 drives with these units can cost far less than constructing a facility to house more disk drive devices, it said.

IBM and the PCMs are transferring an increasing number of functions — such as encoding/decoding data, track and cylinder seeking, drive speed control, data buffering, diagnostics/maintenance — to the disk controller through the use of microprocessors, the report said. Putting these functions on the disk controller will generate a major increase in overall disk subsystem throughput, the report stated.

A shortage of data storage by the early 1990s could result from the current better than 50% annual million instructions per second growth rate of medium- to large-scale computer installations, the greater acceptance of IBM's MVS/XA operating system and the surge of personal computers poised to go on-line during the next few years, the report said.

Disk controllers, storage management software and specialized techniques, such as Winchester design and the thin-film process, must be enhanced if improved disks are to be managed and accessed efficiently.

The study — which costs $75 — is available from Applied Management Services, 180 E. Main St., Patchogue, New York 11772.



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NICE

from page 57

years have gotten used to getting nonanswers and waking up to find that everything in their data centers has been rendered obsolete by IBM's latest product announcement.

Skepticism dies hard. When IBM rather suddenly starts being nice, the immediate reaction is to wonder, "What's up?" Crocodiles are said to appear to be smiling just before making it painfully clear that it's time for lunch, and you're it.

After all, why should IBM be nice? The company seems to be riding higher than ever. It has whipped the pants off virtually all its competitors and in the process managed to streamline its internal operations to churn out better products at a faster pace. If anything, this is a time when IBM could get away with being more arrogant than usual.

The reason rests in IBM's realization of a grim fact: it has become its toughest — and probably most ruthless — competitor. The products from smaller companies that are IBM-compatible, cost less and offer better performance aren't causing IBM its biggest problems. It's the continued rumors and speculation about how IBM will surpass its own products that spreads what one industry watcher is fond of calling "fear, uncertainty and doubt," among IBM users.

The 3080 series is a classic example. In anticipation of the Sierra, which turned out to be the 3090 series, most industry analysts were predicting the 3080 machines were about to join the ranks of the electronic dead. Consequently, in the two months prior to the 3090 announcement, 3080 sales almost came to a standstill. Even three months after the 3090 announcement and IBM's insistence that the 3080 is not on its way to the computer tar pits, IBM still is selling about half as many 3080s as it did a year ago. Even taking into consideration the recent overall slowdown in computer purchases, 3080 sales are still off.

Skepticism arises

Here's where the lingering skepticism comes into play. Historically, when IBM announced a line of mainframes, the old ones had about as much future as a crippled racehorse. IBM's claims that the 3080 is not dead are hard to swallow. The historical facts indicate otherwise. Then there are the rumors. Ever since the "Ivory Letters" on the 3090 Model 200 hit the streets, there have been persistent speculations that the system is a ruse — another 3081 Model D, if you will. The speculation goes that the "real," more powerful Model 200 will be announced when IBM is satisfied it has milked all it can out of the aging 3080s.

The theory of the bogus Model 200 is questionable. IBM appears set to deliver too many of the processors in late 1985 and early 1986 to pull off the old switcheroo in mid-delivery cycle. Remember, this is the new, friendly IBM.

But you can put money on the fact that if IBM has got a dual-processor 3090 Model 200 ready for high-volume shipments in the first quarter of 1986, there must be a uniprocessor version of the 3090 ready to be rolled out whenever IBM sees fit. If the Model 200 is, in fact, the real thing, the performance of the uniprocessor 3090 will wipe out much of the 3080 line.

So is IBM lying? Not really. There are two ways to look at IBM products: residual values and how a product fits into IBM's long-term product strategy. If you want to talk about residual values, the 3080 series is on its last strong drive. But in strategic terms, the machines appear to have some life left.

IBM seems to be promising it will not, at least for the next few years, dramatically change its large systems architecture in such a way that precludes 3080 series systems from taking advantage of the latest IBM software and operating system advances. That is not necessarily a promise that IBM will refrain from announcing systems which, from a price/performance standpoint, appear more attractive than the 3080s.

IBM, friendly or not, is and will remain in the business of making money. The latest trend toward being nice is nice. But don't take a few smiles to mean that the big blue giant has become gentle.

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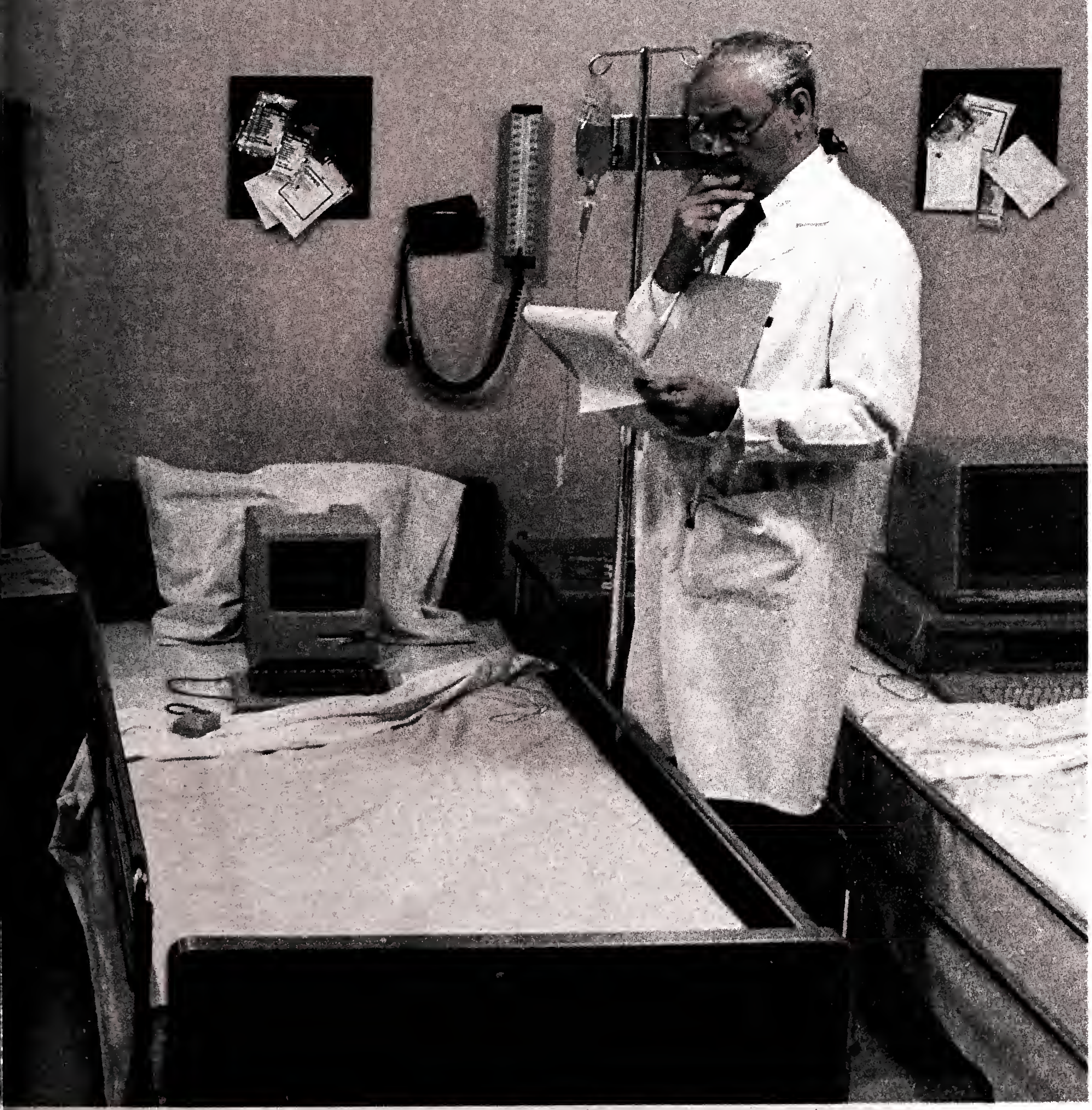

NET

from page 57

gained only through Computervision's high-end CDS 4000 computer-aided engineering and CAD/CAM minicomputer. Last week's announcement means that users of low-end workstations, such as the IBM Personal Computer AT, can access the capabilities of the host system.

The CDS II software also allows users of Digital Equipment Corp. VAX series minicomputers to tie into the CDS II network, the vendor said.

The price of the CDS II system is $10,000 per workstation, a company spokesman said.

Patchwork solution

CAD/CAM market analyst Peter Cohen of International Data Corp. in Framingham, Mass., called the Computervision product announcement a patchwork solution. "The ultimate solution will be to port the [Cadds 4X] software to run on all workstations," Cohen said. "But as a holding measure, the CDS II is a step in the right direction. It was very important for them to do something to integrate their hardware platforms. It's clearly the direction they have to go."

The company has seen its steadily eroding CAD/CAM market share result in sharp losses so far this year. The company reported an $18.8 million loss for the first quarter and has laid off 950 employees, the most drastic work-force reduction by any high-technology company outside the semiconductor industry [CW, April 15].

Although Berrett said the company expects to attract new users with the CDS II capability, Cohen believed the product will only help secure Computervision's installed base of customers.

"I suspect it won't be effective in attracting new customers, but it will keep their current client base satisfied until they develop something for fuller integration," he said. "The $10,000 price is a considerable addition to the base price of small workstations."

'Pent-up product appetite'

Berrett said the economic future of Computervision depends more on overall economic factors than on any product, including CDS II. "Our rebound depends on the rebound of the U.S. economy," he said. "We believe there is a pent-up appetite for our products, but our customers will decide at their board levels how much spending they can afford. We feel [the CDS II] clarifies for our sales force how to talk about our entire product line, and it gives us a system capability that we never had before."

Berrett said he could not predict near-term economic factors but that the company had no further layoffs planned.

Computervision is located at 15 Crosby Drive, Bedford, Mass. 01730.

SCIENCE/SCOPE

A new radar can map military targets with high resolution equal to that of infrared devices, even in rain and other bad weather. The Advanced Synthetic Aperture Radar System (ASARS-2), designed to complement electro-optic sensors, is flown on a U.S. Air Force TR-1 reconnaissance aircraft and provides real-time radar imagery to a ground station. ASARS-2 operates in all weather at ranges far exceeding the capabilities of infrared and other electro-optic devices, thanks to new state-of-the-art signal processing and other advances. The Air Force gave the system an excellent rating after it underwent strict operational performance tests as part of a "fly-before-buy" program. Hughes Aircraft Company is producing the system under a development and production contract. Eventually ASARS-2 is expected to be adapted for tactical aircraft and mobile tactical stations.

NASA's Project Galileo Probe, which will explore the planet Jupiter later this decade, must arrive at a precise angle if it is to carry out its measurements of the chemical composition and physical state of the Jovian atmosphere. The Hughes-built probe will arrive at 107,000 miles per hour, fast enough to travel between Los Angeles and Las Vegas in nine seconds. If the probe hits at too shallow an angle, it will skip off into space; too steep, it will be reduced to ashes. Even at the proper angle, the probe will encounter extremes never before faced by spacecraft. In less than two minutes, much of the forward heat shield will be eroded by temperatures of thousands of degrees. With atmospheric entry forces reaching 360 times the gravitational pull of Earth, the 742-pound probe will take on a weight equal to an empty DC-10 jetliner. Project Galileo is scheduled to be launched from the space shuttle in May 1986 and to arrive at Jupiter in August 1988.

Two versions of a new color image recorder, designed to provide the means to capture on film the precise color image from television monitors, have been introduced by Hughes. The high-fidelity TV recorders, Models CIR 100 and CIR 200, interface directly with a color display. They contain their own high-resolution, flat-face cathode-ray tubes, primary color filters, and controls for exposure and color. They record on either 35-mm or instant film with the high resolution, brightness, and color range necessary for scientific, medical, or other applications where accuracy is essential.

Lasers soon will be inspecting solder joints of fighter aircraft radars, thanks to new manufacturing technology being set in place at Hughes. Solder joints will be examined by a computerized technique using lasers and fiber optics, the glass threads that carry laser light transmissions. The process will free manufacturing personnel from tedious and time-consuming inspections of more than 36 million solder joints created in a single year's production. The project is part of an Industrial Modernization Incentive Program (IMIP) awarded by the U.S. Navy and Air Force. IMIP is a share-the-savings concept that will reduce costs of the F-14, F-15, and F/A-18 radar programs by more than $10 million, while improving the quality and reliability of the systems.

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TERMINALS

■ **Paradyne Corp. has announced a workstation that is said to allow the centralized control of a data communications network from one console.**

The Analysis workstation provides interactive access to network management information including problem detection and control of network software from a terminal. Host application systems such as IBM's NCCF and Network Problem Determination Application can be used, and the unit can be connected to a host IBM mainframe computer, the vendor said.

The basic unit, containing a terminal upgraded with communications facilities, Digital Research, Inc.'s Cdos operation system, two floppy diskettes with a total of 640K bytes of storage, 192K bytes of memory (upgradable to 640K bytes), the CRT and keyboard, costs $6,000.

Paradyne, P.O. Box 1347, 8550 Ulmerton Road, Largo, Fla. 34294.

■ **GTE Telenet Communications Corp. has announced a network color graphics monitor for GTE Telenet public and private nets.**

The Color Monitor is said to allow operations managers to view network operations in real time with color graphics. Operating parameters such as configuration, traffic levels and line performance appear in a variety of geometric shapes, numbers and lines. The unit costs $52,000.

GTE Telenet, 12490 Sunrise Valley Drive, Reston, Va. 22096.

COMPUTER INDUSTRY

Ungermann-Bass undaunted by losses

Foresees upward turn after first-quarter dip

COMPANY PROFILE

By Kathleen Burton
CW West Coast Bureau

SANTA CLARA, Calif. — Local-area network vendor Ungermann-Bass, Inc.'s long string of uninterrupted financial successes has finally ended.

After averaging 50% growth a year and gaining $33 million from an initial public offering in 1983, the firm experienced a first-quarter loss this year of approximately $500,000, and revenue declined 23% to $11.9 million, compared with $15.5 million for the previous quarter.

Ungermann-Bass claims to be the world's largest supplier of general-purpose local-area networks, with approximately a 30% share of a market estimated by Dataquest, Inc. at $125 million for 1984. However, a variety of factors are causing mounting problems.

The company's first-quarter downturn was caused by a combination of short- and long-term factors, according to Harvey Freeman, an analyst at Minneapolis-based Architecture Technology Corp., a communications consulting firm. According to Freeman, the loss resulted from technical problems with radio frequency modem products, which curtailed delivery of broadband network products; restricted shipments of personal computer networking products because of a software conversion to Microsoft Corp.'s MS Network, which Ungermann-Bass has adopted as a de facto standard; and the slowing of shipments of broadband networks, now half of Ungermann-Bass' business, as the product line was converted to Intel Corp.'s 16-bit 80186 microprocessor.

Ungermann

James Jordan, Ungermann-Bass' executive vice-president in charge of marketing and product development, agreed that these problems set the company back but said they have been resolved. The new software and personal computer interface units will be available in June, the transition to 16-bit microprocessors has been completed, and the difficulties with offshore radio frequency modem production have been overcome, he said, with Ungermann-Bass' radio frequency modem plant in Japan in full production. "We're back on track after an unexpectedly bad first quarter and expect 35% revenue growth for the remainder of 1985," he said.

Founded in 1979, the company's initial success was built on the Ethernet-based Net/One system, one of the first Ethernet systems that used very large-scale integration technology to reduce interface costs significantly. Introduced in 1980, Ungermann-Bass' Net/One general-purpose local-area network proved popular among end users of Digital

See **PROFILE** page 66

- ■ High technology has not produced high wages for women, according to a recent study that claimed women are relegated to clerical and low-level production jobs/**64**
- ■ Wang may resort to layoffs in an effort to cut costs further/**65**
- ■ DEC last week announced it had filed a patent infringement suit against a manufacturer of VAX-11/780- and VAX-11/785-compatible memory controllers, SBI interface boards and memory boards/**70**

Symbols indicate Apple lacks winning business strategies

'Work groups sharing a network need centralized storage for files and electronic mail. [Apple Computer, Inc.'s] file server will be just one of many file and disk servers on the market for the Macintosh Office.'
— statement by Apple President John Sculley and Chairman Steven P. Jobs from Jan. 23 introduction of Macintosh Office

'Many people have asked when Apple will introduce a Macintosh that has a built-in hard disk, enlarged screen and the internal capacity to process very complex business applications. We already have such a Macintosh. It's called the Lisa 2/10 . . . we're changing its name to Macintosh XL — to communicate better that the XL is truly an extra-large Macintosh.'
— comments by Mike Murray, director of marketing for Macintosh, at Jan. 23 introduction of Macintosh Office

ANALYSIS

By Peter Bartolik
CW Staff

Apple's Macintosh XL was the adult box that lent credence to Apple's insistence that the nifty little Macintosh was just "the first step in our larger plan to provide solutions needed by business."

Apple's file server was to be the "hub of the work group network," the machine providing multiuser data base and accounting functions. Rather than being in-

See **APPLE** page 75

Geisco to revise market target, cut staff by 400

ROCKVILLE, Md. — General Electric Information Services Co. (Geisco) recently said it plans to revamp its business to target segmented markets and will lay off 400 marketing, sales and technical employees.

Walter Williams, Geisco's president, said the planned changes in the computer services company mirror the change in the market from a "generalized to a segmented business." Geisco, a subsidiary of General Electric Co., said it plans to outline further its reorganization on June 4.

"Geisco must more aggressively execute

See **GEISCO** page 74

Black hole in home micros?

INDUSTRY INSIGHT
Paul Korzeniowski
CW Senior Writer

Although I am loath to admit it, in many ways I fit the yuppie mold, with desires for a videocassette recorder and cable television, not because I need them, but rather because without them, I feel like I am missing something important.

I consider myself at the crest of the home computer buying wave, which will crash when droves of yuppies transform home computers into chic status symbols.

For a few years, I had contemplated buying a micro to write stories at home, and two months ago I decided that the time was right.

Home computer prices were falling. Systems were advertised for only several hundred dollars rather than a few thousand dollars. Therefore, I set out in earnest to purchase, not merely to price, a home computer.

My first stop was at an Apple Computer, Inc. dealer. I told the salesman that I wanted a WP package with a letter-quality printer and a $1,500 price tag. He showed me an Apple IIe and a dot matrix printer for $2,100. That was not exactly what I was looking for, so I repeated the request. He showed

See **HOME** page 72

TI president, CEO resigns after 32 years with firm

DALLAS — Texas Instruments, Inc. President and Chief Executive Officer J. Fred Bucy recently resigned after 32 years with the company and Executive Vice-President Jerry R. Junkins was been named to replace him.

Bucy, 56, said he was resigning to pursue other interests and to take advantage of TI's early retirement program, which allows employees to retire at 55.

Bucy also resigned from his seat on the board of directors and will continue to serve the board in an advisory capacity, according to the company.

TI is coming off one of the worst quarters in its history with earnings off 89% from the previous year [CW, April 29].

Chip market down

Hit especially hard by the slumping demand and product backlog in the random-access memory semiconductor marketplace, TI announced the layoff of 1,000 employees in April.

Junkins, 47, was most recently responsible for TI's government electronics, data systems and industrial controls divisions and for the company's internal information systems and services organization.

Junkins worked at TI since 1959 and was elected to the board of directors in 1984.

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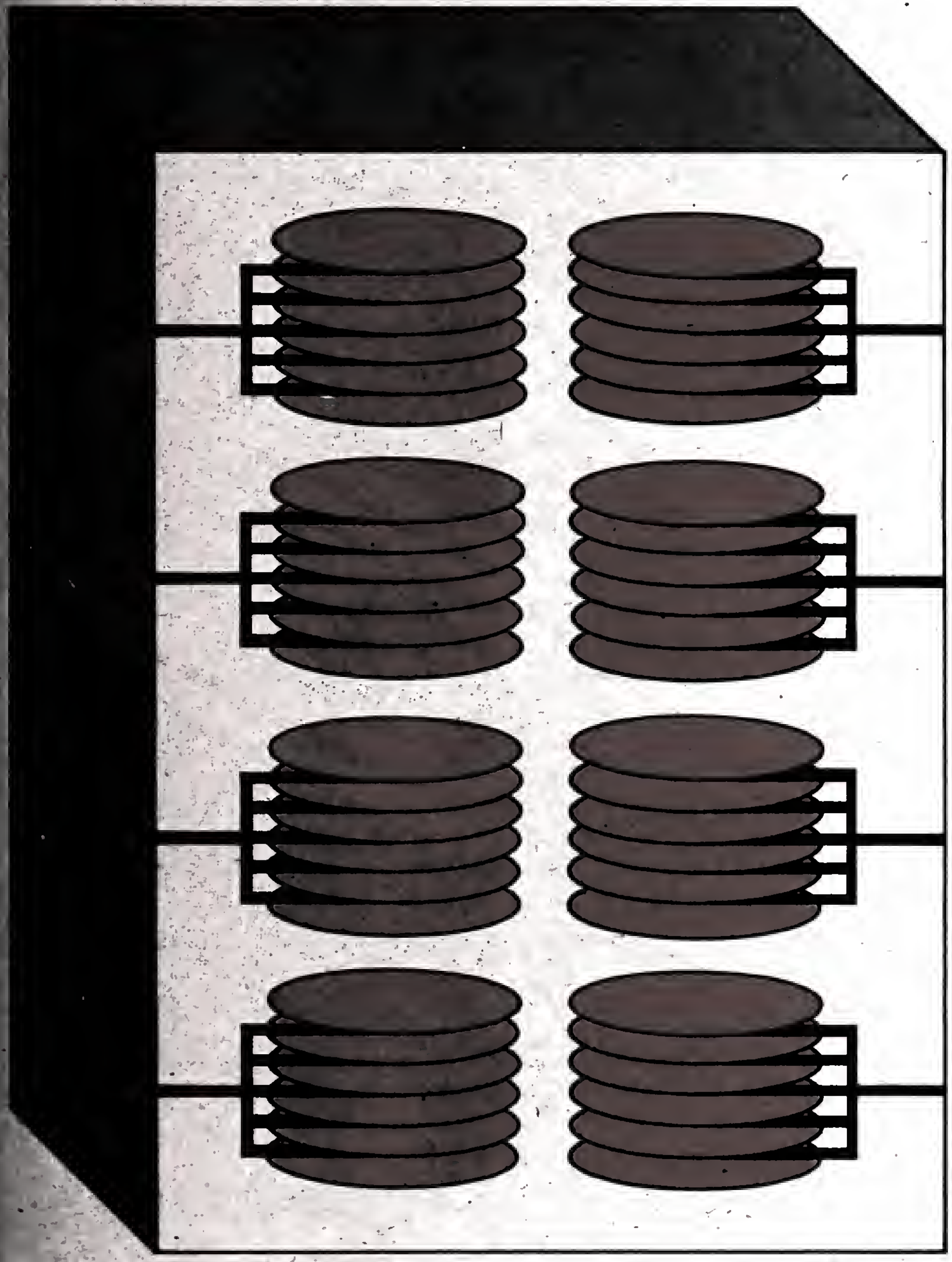

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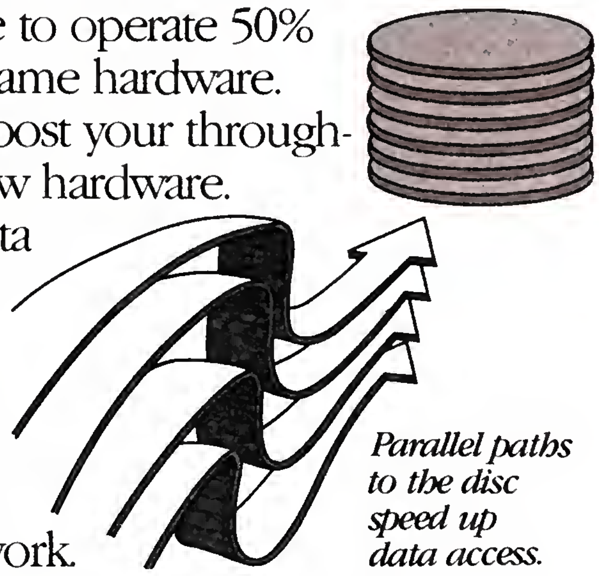

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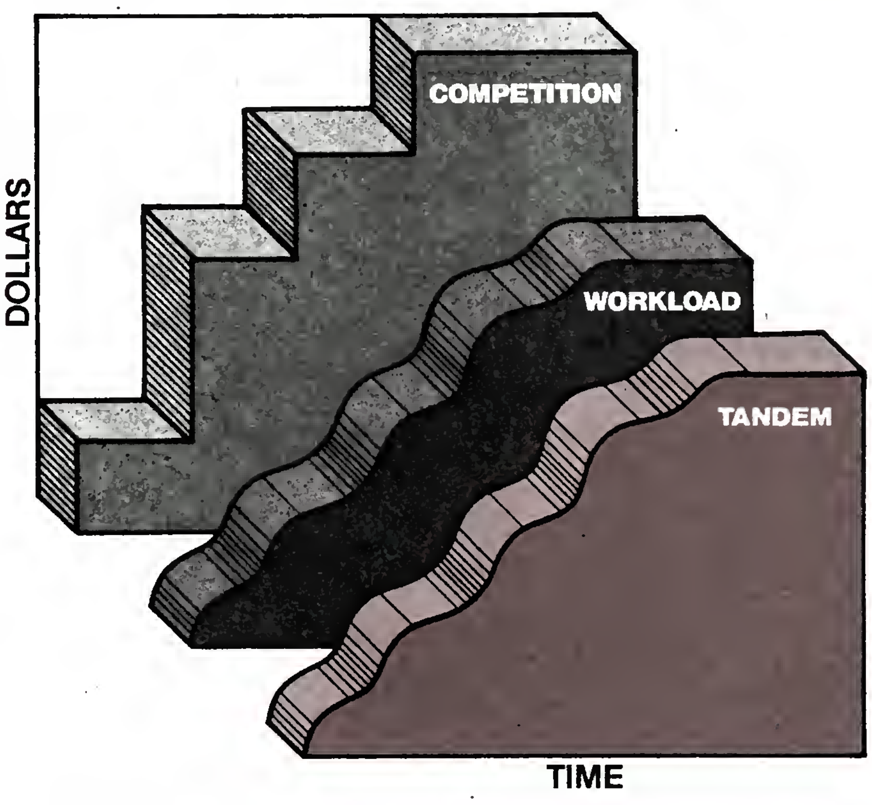

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TANDEMCOMPUTERS

Study: Women at low end of computer jobs spectrum

By Kathleen Burton
CW West Coast Bureau

PALO ALTO, Calif. — Computer-related occupations have failed to provide women either with sufficient opportunities for advancement or top-of-the-line salaries.

So said a national study released by Stanford University researchers. According to the study, men clearly held most of the high-paying occupations in computer-related industries, while women worked in the lower paying occupations in the industry.

The study, by Myra Strober, an economist and director of Stanford's Institute for Research on Educational Finance and Governance, "dispels the myth that high technology is automatically a great equalizer of occupational disparities between men and women," Strober wrote.

Hold low-level jobs

Comparing 1970 and 1980 census data, the study found that most women in high-technology industries held clerical or low-level production jobs, while most men held production, managerial and professional-technical jobs.

"In the highest paid, highest prestige computer-related occupations, women are virtually absent," the report stated. "In 1970, women were only 2% of all engineers in the computer industry; in 1980, that number increased to only 5%," the study found.

And women computer scientists and systems analysts grew only 7% over the decade, even though these professions themselves more than doubled in size.

Results surprising

According to Carolyn L. Arnold, a graduate student at Stanford University who coauthored the study, the results were surprising, because there are now so many women getting degrees in mathematics and science. However, this disparity may be the result of a male-oriented "engineering culture that continues to bar women from the upper ranks of these professions," according to Arnold.

Another factor contributing to the results, Arnold said, is that the work pressures and long hours of professional jobs in technological industries may still be a barrier for women who are trying to balance their home and work lives.

There is a common misconception that computer-related industries are less stereotyped than older industries, allowing talented women open access to fast-track career paths and high salaries, asserted Sandra Kirkpatrick, assistant director of the Stanford institute.

Successful individuals

For some women, this is true, Kirkpatrick said. "There are always individual women who are making it in areas like the Silicon Valley, but nationally the aggregate is not doing very well," she said.

The Stanford study also found significant salary discrimination between men and women in computer-related occupations. Of the three high-technology professions that were studied — systems analysts, programmers and computer operators — women earned approximately 72% of the salaries of their male counterparts, Kirkpatrick said.

According to Kirkpatrick, men earn more than women largely because women are still working in lower paying, end-user industries, rather than in those professions that develop and manufacture the hardware and software.

The lower paying, end-user industries studied included banking, insurance and retailing, Kirkpatrick said.

In spite of the salary disparity, however, women continue to choose high-technology professions because "they are still optimistic about high technology opening doors for them," Kirkpatrick said.

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Layoffs loom over Wang for first time in 12 years

LOWELL, Mass. — For the first time in some 12 years, Wang Laboratories, Inc. may resort to layoffs as a means of reducing expenses. The office automation leader announced last week that as many as 100 employees may be dismissed in 30 days.

The layoffs will affect administrative staff workers at Wang's corporate headquarters here. The company has already transferred some staff workers into sales, support and maintenance positions.

Approximately 100 additional employees will be dismissed with severance pay if Wang is unable to find positions for them.

Wang had announced earlier that most of its production work force would be required to take its vacation time during a production shutdown this summer. The company is also curbing nondiscretionary spending.

Recovery effort follows 66% profit drop

Wang is trying to recover from the worst downturn in its successful history. Its profits fell 66% in the quarter ended March 31, the first earnings drop for Wang since 1975 and a marked contrast to its consistent 30% growth rates of the last several years.

Industry analysts said Wang has been hurt by both the overall slowdown in computer demand as well as a loss of office automation market share to IBM products such as the System/36. Wang is attempting to regain customers with an aggressive advertising campaign against IBM.

Wang, which employs 30,000 people worldwide, has not ruled out future layoffs as cost-cutting measures.

Prime files suit against repair firm

DENVER — Prime Computer, Inc. recently filed suit against a small, Colorado-based third-party software maintenance firm for allegedly infringing on Prime copyrights and misappropriating trade secrets.

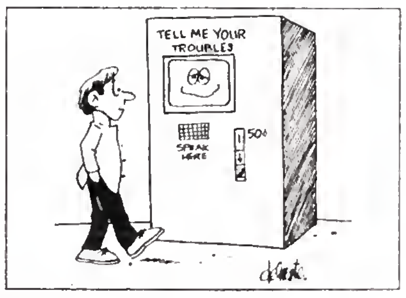
Prime is seeking a preliminary injunction against Tristan Dynamics, Inc. of Parker, Colo., that would require the defendant to deliver all Prime materials in its possession to the U.S. District Court here. The suit was filed May 17.

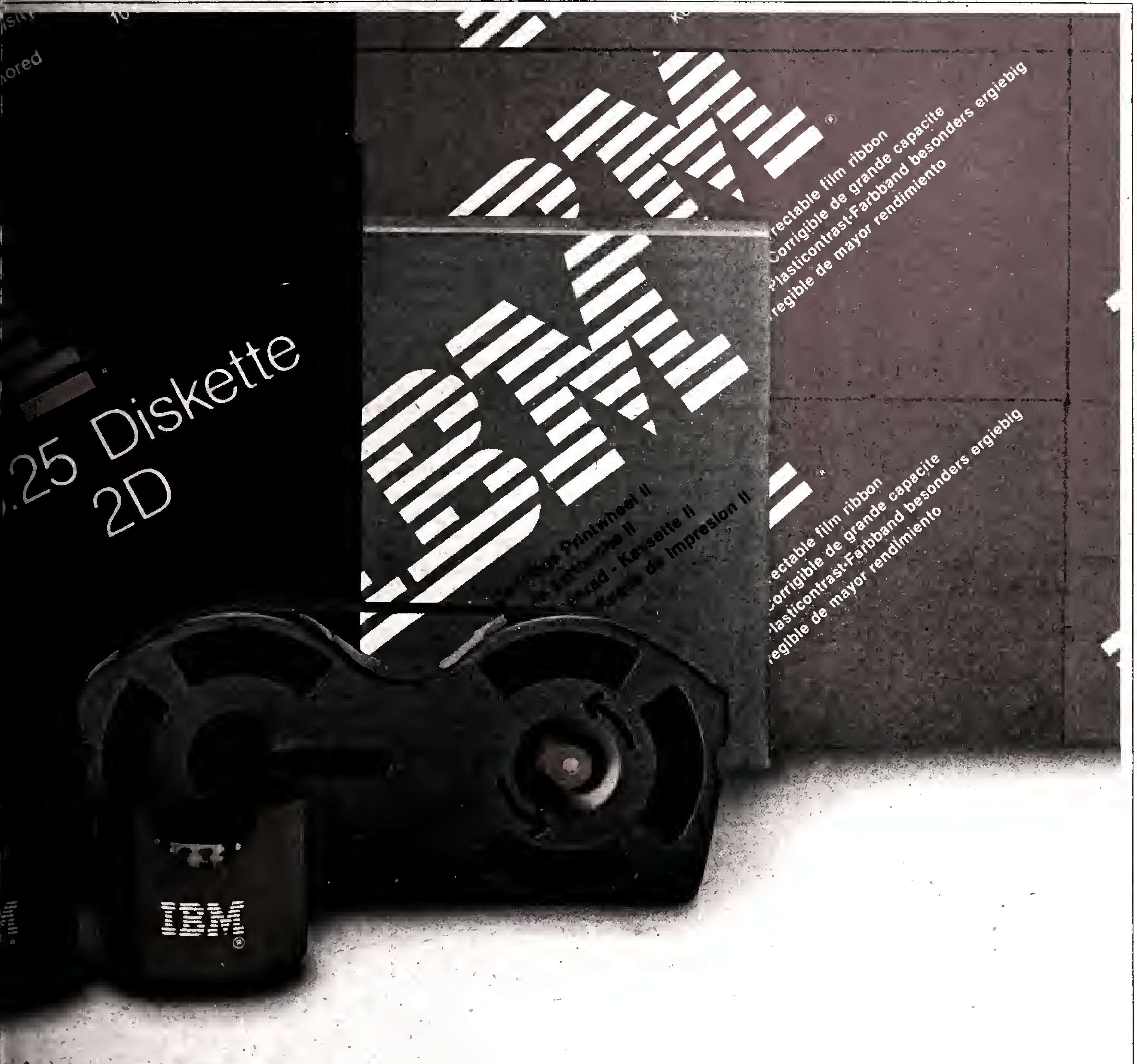
Tristan Dynamics is a privately held, 50-employee company that services users of Prime software systems. Tristan claims to have benefited from user dissatisfaction with Prime's policy of bundling maintenance contracts for its hardware and Primos operating system [CW, Oct. 15, 1984].

In the suit, Prime is also seeking to recover actual and multiple damages and to prevent permanently Tristan from using Prime materials in its maintenance business. Prime has charged that Tristan induced former Prime employees who went to work for Tristan to breach Prime's nondisclosure agreements and bring field engineering manuals and other proprietary materials relating to Prime software maintenance to Tristan.

A Prime spokesman said the litigation is "in accordance with Prime's ongoing effort to police vigorously and protect its proprietary information rights." Prime is headquartered in Natick, Mass.

Tristan Dynamics President Bill Sheppard declined to comment on the lawsuit.

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IBM net market entry force in Ungermann-Bass buildup

COMPANY PROFILE

Ungermann-Bass, Inc.'s decision to strengthen its product lines and technologies is strongly influenced by IBM's entry into the local-area network market.

Although IBM announced its PC Network for personal computers in August 1984, the network is only now reaching the market. And IBM's token-ring network, developed in cooperation with semiconductor manufacturers Texas Instruments, Inc. and Intel Corp., has yet to appear on the market.

Even though IBM's products have not yet reached the market, Big Blue's presence is strong, and the trend toward IBM compatibility is clear, according to Ungermann-Bass President and Chief Executive Officer Ralph Ungermann. The company will avoid competing directly with IBM but will align its products with IBM's and support IBM's token-ring standard, Ungermann said.

Vendor-independent solutions

According to Ungermann, IBM's approach to local-area networks will be to interconnect IBM equipment with token-ring and Systems Network Architecture technologies. Though Ungermann-Bass will support this, he said, it will continue developing vendor-independent solutions that will also allow users to take advantage of both Ethernet and broadband technologies.

William Krause, president of 3Com Corp., an Ungermann-Bass competitor based in Mountain View, Calif., said that IBM's entry into local-area network markets adds credibility to the local net concept.

"It also means IBM won't introduce distributed connection products because it doesn't want to cannibalize its existing mini and small mainframe products," Krause said.

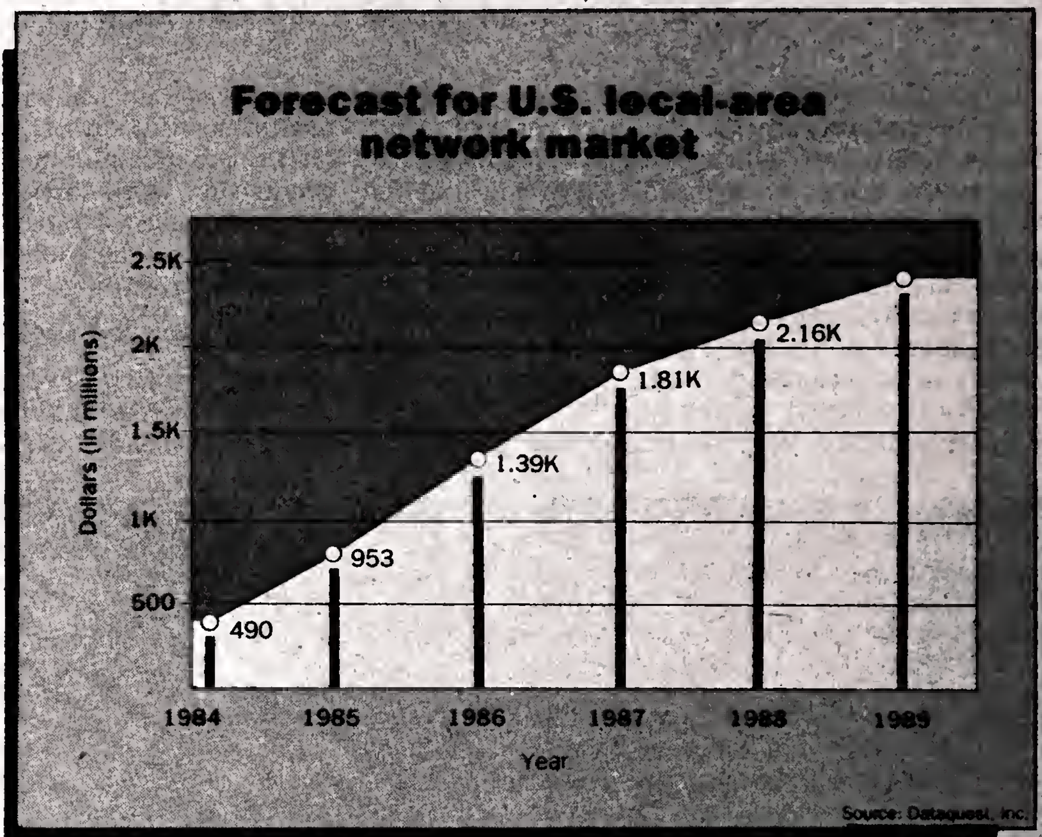
IBM net entry breeds uncertainty

On the downside, however, IBM's foray into local-area nets breeds uncertainty, and customers will delay local-area network purchases to wait for IBM's future products, Krause said.

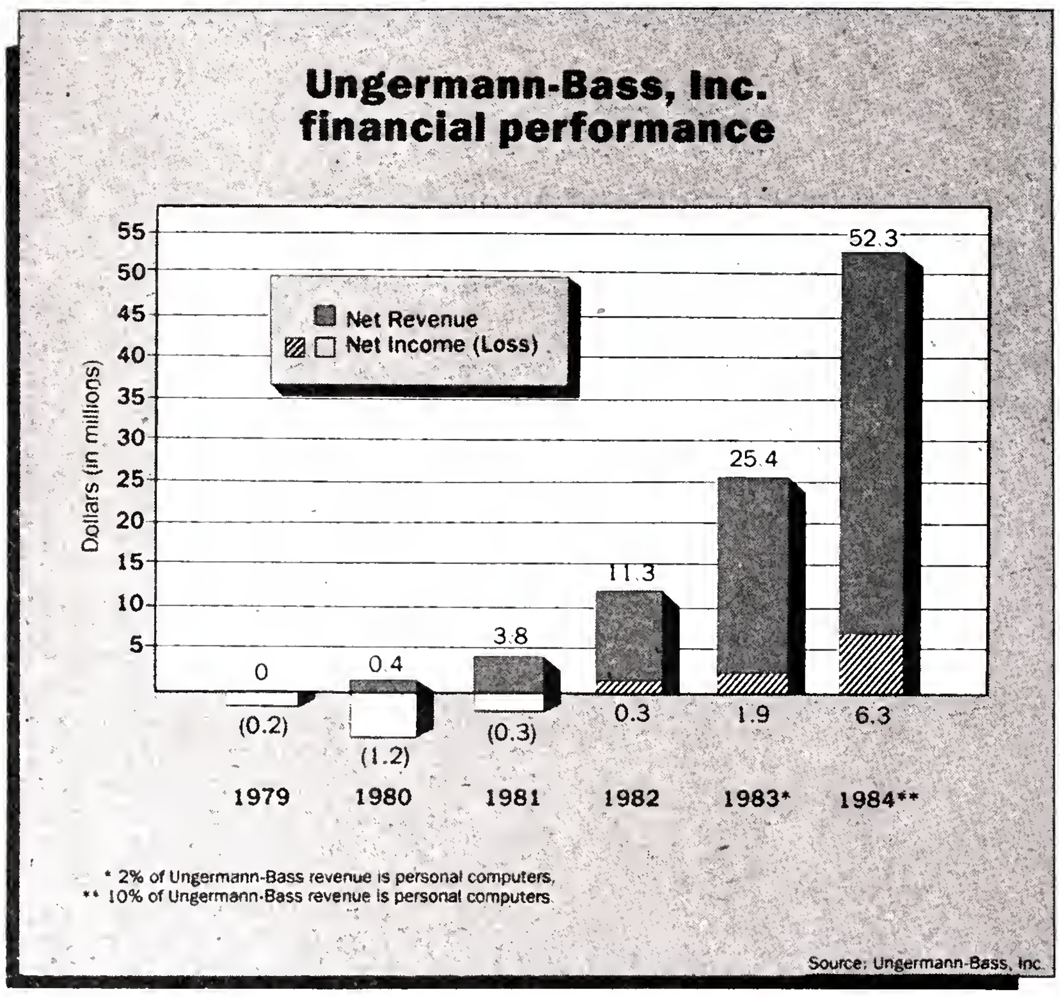
According to Karen Mulvaney, a local-area network specialist with New York-based L. F. Rothschild, Unterberg Towbin, there are enough weaknesses in the IBM product line to keep Ungermann-Bass viable, offering alternative but IBM-compatible solutions. "I don't think IBM has a master plan for local-area networks," Mulvaney added. "[It's] getting into a whole new marketplace, taking it one step at a time and learning [along the way]."

Early fears that IBM would dominate the local-area net market by establishing a single networking standard have disappeared, she said. "IBM may make one or two of its local-area networks a de facto standard, but more than that is not likely, as it would confuse the marketplace."

— Kathleen Burton



Source: Dataquest, Inc.



* 2% of Ungermann-Bass revenue is personal computers,
** 10% of Ungermann-Bass revenue is personal computers.

Source: Ungermann-Bass, Inc.

PROFILE from page 61

Equipment Corp. systems seeking a cost-effective method of interconnecting mini and terminal bases.

"Ungermann-Bass was the only [local-area network] game in town in 1979," said Brian Jeffery, director of research for the Palo Alto, Calif.-based consulting firm International Technology Group, Inc. Systems vendors like DEC were slow to introduce their own products, and most of the other firms competing in this market failed to develop credibility, Jeffery said.

The company faces a new set of challenges this year, according to President and Chief Executive Officer Ralph Ungermann. These include an energized IBM, a predicted market shakeout and a horde of competitors moving into markets once dominated by Ungermann-Bass.

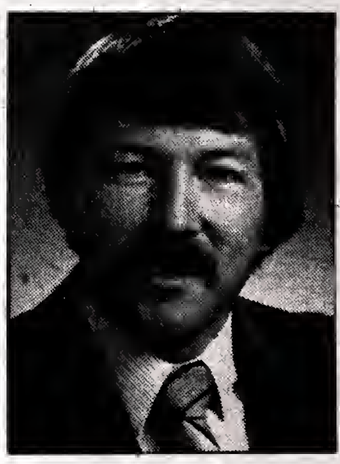
According to Ungermann, competitors in Ethernet products include Bridge Communications, Inc. in Mountain View, Calif., and Interlan, Inc. in Westford, Mass. Competitors in the personal computer area, Ungermann said, are IBM; Nestar Systems, Inc. in Palo Alto, Calif.; Corvus Systems, Inc. in San Jose, Calif.; and 3Com Corp. and Sytek, Inc., both in Mountain View, Calif. Also offering a threat in private branch exchange-based systems are IBM, AT&T and a

See **PROFILE** page 67

Net maker's focus: factories

Local-area network manufacturer Ungermann-Bass, Inc. is nothing if not ambitious.

With a joint venture with industry giant General Electric Co. under its belt, Ungermann-Bass will obtain a 100% market share in the emerging market for factory local-area network systems, according to Ralph Ungermann, company president and chief executive officer. A multimillion-dollar contract with General Motors Corp. to develop local-area networks for its assembly and fabrication plants lends credibility to this supposition, he said.



Davidson

The Yankee Group, a market research firm in Boston, predicted that the factory local network sector will grow from $50 million in 1984 to $1 billion by 1990.

Like many other vendors that have targeted this market, the Ungermann-Bass/GE joint venture, Industrial Network, Inc., is focusing on the Manufacturing Automation Protocol (MAP) standard, originally developed by GM in cooperation with a group of vendors including IBM, that is gaining wide support.

"Factory local-area networks are a huge market," Ungermann said. GM will spend $60 billion over the next five years to automate truck and bus assembly plants, much of this for net technology, he added.

The problem facing Ungermann-Bass, however, is that the MAP standard has already drawn a number of serious competitors, including Concord Data Systems, Inc., a Waltham, Mass.-based broadband local-area network vendor that was one of the original GM MAP program participants, and IBM itself, which plans to offer its own MAP-based system.

Ungermann-Bass remains confident it can beat the competition, however. With GE providing $6 million in funding and its token bus product expected by the second quarter, the company has an important technological edge, Ungermann-Bass officials said.

Ungermann-Bass' technical trump card is its proprietary very large-scale integrated technology, noted John Davidson, the company's vice-president of research. He said its token bus semiconductors will not be released into the marketplace, which means that Ungermann-Bass has a two-year lead time over other network vendors that must wait for token bus chips.

"Ungermann-Bass will never gain 100% of the factory local-area network market," said Brian Jeffery of Palo Alto, Calif.-based International Technology Group, Inc. He contended that most large-volume end users will want a multivendor approach to factory automation.

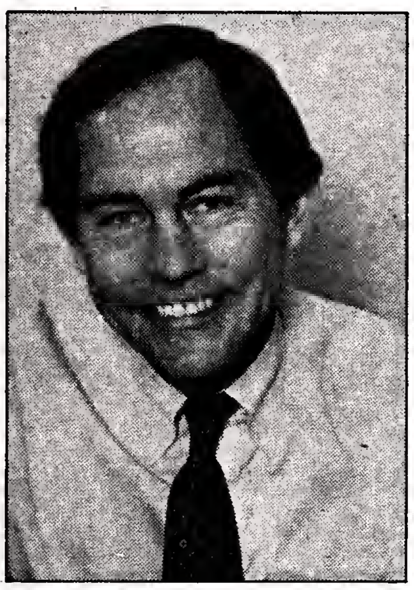
— Kathleen Burton

PROFILE

from page 66

variety of other PBX vendors.

Despite this mounting competition, Ungermann-Bass' strategy involves expanding its product lines and marketing organization to cover all segments of the local-area network market. In June the company expects to introduce a number of products, including a broadband-based token bus for the industrial automation market and network interface units that will connect IBM terminals and controllers. Also slated for introduction are a token-ring version of its Net/One product and an IBM-compatible token-ring interface device.



Jordan

Bracketing the local-area network market with a range of products is critical to Ungermann-Bass' long-term success, said John M. Davidson, the firm's vice-president of research. The company will continue to follow major market trends by adding products, Davidson said. "At the risk of spreading our technology too wide, we'll remain market driven. If a customer needs it, we'll put a new product into the lineup," he said. This foray into many different technologies is the key to success, letting the company win major contracts from large OEM vendors like Hewlett-Packard Co. and Xerox Corp., Davidson said.

This ambitious across-the-board game plan has drawn mixed reviews from analysts. "Ungermann-Bass does have a tendency to spread itself too thin. It should go deeper into specific [local-area network] segments," observed Karen Mulvaney, a local-area network specialist with New York-based L. F. Rothschild, Unterberg Towbin. This strategy is risky, Mulvaney said, because Ungermann-Bass' Ethernet-oriented competitors have breadth within individual local-area network sectors and are constantly introducing products. "Ungermann-Bass will have to run like crazy to keep up," she predicted. To do so, the company has targeted a hefty $12 million (approximately 15% of its 1985 revenue) to research and development projects this year, she said. According to Paul Scherer, an analyst with Robertson Colman & Stephens, Inc., a San Francisco investment firm, Ungermann-Bass will survive a shakeout that, by decade's end, will reduce the field of general-purpose local-area network manufacturers from 60 to 20 vendors.

Ungermann-Bass has several strengths that will allow it to do this, Scherer said. It is the leader in the terminal connection segment of the market and is also investing heavily in the rapidly growing personal computer area, which now represents 10% of its revenue. And with an 1,100-unit installed base, the company is well positioned to gain more add-on clients that now account for 80% of its business, Scherer said. Additionally, the local-area network market as a whole will be helped by the emergence of protocol standards, Scherer added, with IBM's personal computer network and token-ring technology speeding this along.

Ungermann-Bass is also using third-party tie-ups to build up its market presence as it faces today's tough competition, Scherer said. It has a joint five-year marketing agreement with Codex Corp., a data communications vendor and member of Motorola, Inc.'s Information Systems Group, creating a valuable distribution channel. In 1984 it solidified a joint venture partnership with General Electric Co. to develop a factory floor local-area network. It also has OEM arrangements with industry heavyweights like HP, Xerox and Data General Corp.

> *'We're definitely not the same company we were six years ago. We started planning for this transition a year ago, right after the initial public offering.'*
>
> — **James F. Jordan**
> **Ungermann-Bass**

In 1983 the company acquired the New York-based Amdax Corp., gaining Amdax's substantial broadband technology design and manufacturing expertise. The future will bring similar joint venture arrangements for the company. "We look at five companies a week with this in mind," Ungermann said, "but nothing is on our list right now."

Ungermann-Bass is struggling to come to terms with what Jordan described as its "next-growth phase." "We passed the $50 million revenue mark last year. We're definitely not the same company we were six years ago," Jordan said.

The company was shaken last year by a series of management shifts that reorganized the marketing department and consolidated four separate engineering groups under Jordan's supervision.

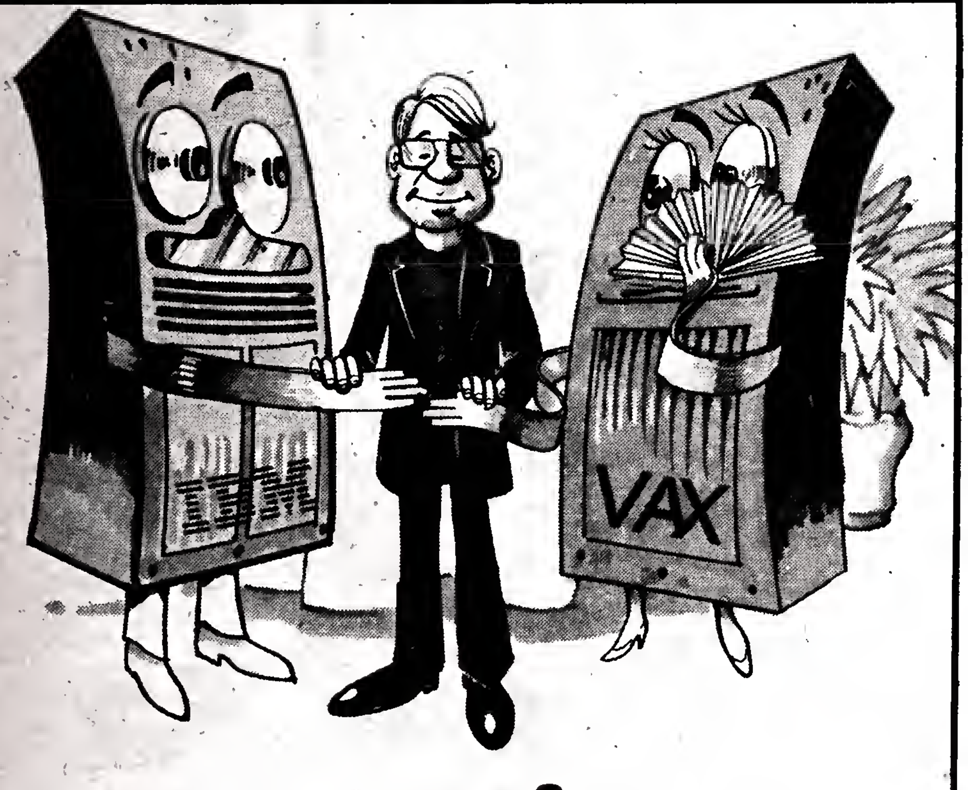
The company was also rocked by the March departure of Charles Bass, board vice-chairman and cofounder, who left the company to pursue venture capital interests. However, according to Jordan, Bass' departure will not affect company strategy or product introductions because "we started planning for this transition a year ago, right after the initial public offering."

In spite of these changes, Ungermann-Bass has been working hard to keep its entrepreneurial spirit while it moves into a more mature growth phase, Jordan said. He cited the company's engineering groups in Massachusetts, Florida, California and Japan as examples. Because each group is developing a different local-area network technology, each is run as an independent venture, which enhances creativity, he said.

The company will rely increasingly on marketing to gain an all-important competitive edge, Ungermann said. Two factors that Ungermann hopes will differentiate Ungermann-Bass from the competition are service and support. "[Local-area] networks are relatively simple, but the critical thing for Fortune 1,000 customers is that they'll perform perfectly," he said. To provide increased service, Ungermann said, direct sales sites are now doubling as customer support groups, offering installation, technical training and on-site repair.

Ungermann-Bass has also moved recently to deal with what analysts call its biggest weakness: a lack of networking software. The company recently acquired 20% ownership of Linkware, Inc., a Boston-based software manufacturer. The two companies are working on several networking products scheduled to be introduced at the end of the quarter, Davidson said.

Network management software, also expected by the end of the second quarter, will be critically important, Davidson said. The software will diagnose hardware problems on computer equipment and "won't automatically blame problems on the network," according to Davidson.



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*Actual time may vary depending upon skill level.

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Datapoint profit loss exceeds predictions

SAN ANTONIO — Datapoint Corp. recently announced a loss of $28 million, or $1.40 per share, for the third quarter ended April 27. The company had previously said it expected a loss of $20 million, or $1 per share.

Edward P. Gistaro, president of Datapoint, said the loss reflected pretax charges of about $27 million for costs associated with work force reductions, office closings, equipment write-downs, of which $6 million was associated with the change in management control, and other charges. Partially offsetting the charges was an extraordinary after-tax gain of $1.9 million resulting from the repurchase of subordinated convertible debentures, the company said.

Revenue for the quarter was $125.5 million, compared with $155 million a year earlier. Operating losses amounted to $37.4 million.

Noting significant progress in restructuring the company, Gistaro said future operating costs have been cut by about $56 million, exceeding the earlier target of $40 million.

In the third quarter of 1984, Datapoint posted profits of $7.9 million, or 39 cents per share.

DG sues Loral after Mil-Spec buy

BOSTON — Data General Corp., an unsuccessful bidder for the Rolm Corp. Mil-Spec Computer Division earlier this year, has filed suit here against successful bidder Loral Corp.

DG, which has supplied its minicomputers to Mil-Spec to be ruggedized for military applications, is seeking to block the transfer of that technology to Loral. DG said the continuance of its relationship with Mil-Spec under the division's new ownership would violate "each and all of the license agreements" made between DG and Rolm for Mil-Spec business since 1969.

In the suit, filed in U.S. District Court here, DG said some of its license agreements for Rolm to market DG's Nova, Eclipse and Hawk computers are not assignable to a different vendor, while others require DG's written consent.

Loral is in the process of acquiring the Mil-Spec division for a reported $100 million. Rolm was required to sell Mil-Spec following IBM's acquisition of Rolm last year.

DEC alleges violation of patents

BOSTON — Digital Equipment Corp. last week filed suit against EMC Corp., a Natick, Mass.-based vendor of DEC-compatible memory controllers, interface boards and memory boards, for allegedly infringing upon DEC patents.

The suit, filed in U.S. District Court here, specifically seeks a permanent injunction to prevent EMC from making and selling VAX-11/780- and VAX-11/785-compatible memory controllers, Synchronous Backplane Interconnect (SBI) interface boards and memory boards. DEC is also seeking treble damages for profits it allegedly lost because of the sale of the compatible products.

The suit is the most recent of several patent infringement claims by DEC. The Maynard, Mass.-based minicomputer market leader is currently pursuing damages from System Industries, Inc. of Milpitas, Calif., for allegedly using proprietary information to make products compatible with SBI interconnects.

In the past, DEC has successfully won lawsuits against vendors for using patented information to make products compatible with DEC Massbus backplanes and RL disks.

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Because these are Net/One® NIUs, the connections can be with the medium of your choice. Broadband, baseband, optical fiber.

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COMPUTER INDUSTRY

NICKELS AND DIMES

Decision Data Computer Corp. announced revenue for the first quarter ended Feb. 28 of $43 million, compared with $32.9 million in the same period one year earlier. Profits were $2.6 million, or 32 cents a share, compared with $1.7 million, or 21 cents per share, for the corresponding period last year.

■

Computer Technology International, Inc. reported revenue for its first fiscal quarter of $11.7 million, compared with $688,000 for the same period a year ago. Profits for the period ending Feb. 15 were $102,914, compared with $102,000 in the same period a year ago.

■

VLSI Technology, Inc. announced revenue for the first quarter of $18.6 million, compared with $14.2 million for the same period last year. Profits were $813,000, or 4 cents per share, compared with $1.3 million, or 7 cents per share, in the corresponding period a year earlier.

■

Valid Logic Systems, Inc. reported revenue for the first quarter ended March 31 of $15.7 million, compared with $9 million for the same quarter last year. Profits were $1.5 million, or 11 cents per share, compared with $1.2 million, or 9 cents per share, in the same period last year.

■

Intergraph Corp. announced revenue for the first quarter ended March 31 of $108.9 million, compared with $78.7 million one year ago. Profits were $14.3 million, or 55 cents per share, compared with $10.3 million, or 40 cents per share, in the same period one year ago.

■

Nashua Corp. reported profits for the first quarter ended March 29 of $4.1 million, or 86 cents per share, compared with $5.9 million, or $1.25 per share, in the same period a year ago. Revenue for the quarter totaled $147.7 million, compared with $152.8 million in the corresponding period one year ago.

■

Daisy Systems Corp. announced revenue for the second fiscal quarter ended March 31 of $29 million, compared with $15.7 million for the comparable quarter one year ago. Profits for the quarter were $4.7 million, or 27 cents per share, compared with $2.6 million, or 17 cents per share, in the same quarter a year ago.

■

The Reynolds & Reynolds Co. reported revenue for the second quarter ended March 31 of $82.5 million, compared with $72.8 million in the same period last year. Profits were $4.8 million, or $1.02 per share, compared with $4.2 million, or 88 cents per share, in the same period a year ago.

■

Applied Data Research, Inc. reported revenue for the first quarter of $34 million, compared with $21.5 million a year ago. Profits were $568,000, or 10 cents per share, compared with $333,000, or 6 cents per share, in the same quarter a year ago.

■

Timeplex, Inc. announced revenue for its third fiscal quarter ended March 31 of $24.6 million, compared with $17.7 million in the same quarter a year ago. Profits were $2.2 million, or 26 cents per share, compared with $1.6 million, or 19 cents per share, in the same period last year.

■

Cipher Data Products, Inc. reported revenue for the fiscal third quarter ended March 31 of $44.4 million, compared with $32.8 million in the same period one year ago. Profits were $4.3 million, or 30 cents per share, compared with $3.3 million, or 23 cents per share, in the comparable period last year.

■

Diebold, Inc. announced revenue for the first quarter of $111 million, compared with $118 million for the same period last year. Profits were $10.4 million, or 80 cents per share, compared with $13.9 million, or $1.07 per share, in the same quarter last year.

■

Standard Register Co. reported revenue for the first quarter of $109.6 million, compared with $101.4 million in the comparable period one year ago. Profits were $7.5 million, or $1.13 per share, compared with $5.6 million, or 85 cents per share, one year ago.

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HOME

from page 61

me a letter-quality printer and assured me that I would never find a complete system for $1,500.

So I left.

Next I journeyed to a Tandy Corp. store to look at Tandy's Model 1000. The IBM Personal Computer-compatible machine had a sales price of $1,100, which included software. My entrance interrupted a conversation between two salesmen. I waited until they finished before asking to look at a Model 1000. One salesman informed me that $2,300 would be needed to purchase a system with a letter-quality printer. I attempted to lower the sales price by stripping some components, such as taking 128K bytes of random-access memory rather than 256K bytes. The salesman handed me a brochure and told me I could find various prices in it.

So I left.

From Tandy I traveled to a store conducting a fire sale on Kaypro Corp. Model 2s, an 8-bit machine that ran Digital Research, Inc.'s CP/M operating system. Kaypro had previously announced an enhanced machine, the Model 2X. The company was left with a huge inventory of Model 2s, so its price had plummeted.

After I told a salesman what I was looking for, he tried to pursuade me to purchase a Model 2X. He explained that for $1,800, I would get more software, two spreadsheets rather than one and a faster processor. Since I didn't even need one spreadsheet, the Model 2's lower price seemed like a much better feature.

My next stop was at a mass merchandiser that was supposedly carrying a Sanyo Business Systems Corp. system. A coworker had informed me that the $995 system ran most IBM software and included a functional word processing package. The machine sounded too good to be true, and it was: The store no longer carried it because the manufacturer had announced an enhanced model.

My search continued for a few more days as I visited or called a number of stores. At the end of the search, I was left with only one system, Kaypro 2, which met my needs and my price range.

The product included a number of shortcomings. First, Kaypro had abandoned the product and was pushing the enhanced model. Second, it would not surprise me if either Kaypro or the store selling its products soon went belly-up. Third, these days there is not much software being written for Digital Research's CP/M operating system. Despite these considerations, I bought the machine.

Gap in the market

My situation points to a gap in the market. For a few hundred dollars, one can purchase a system from Commodore Business Machines, Inc., but this type of system tends to be incomplete. As one adds in disk drives, software and other essentials, prices rapidly climb.

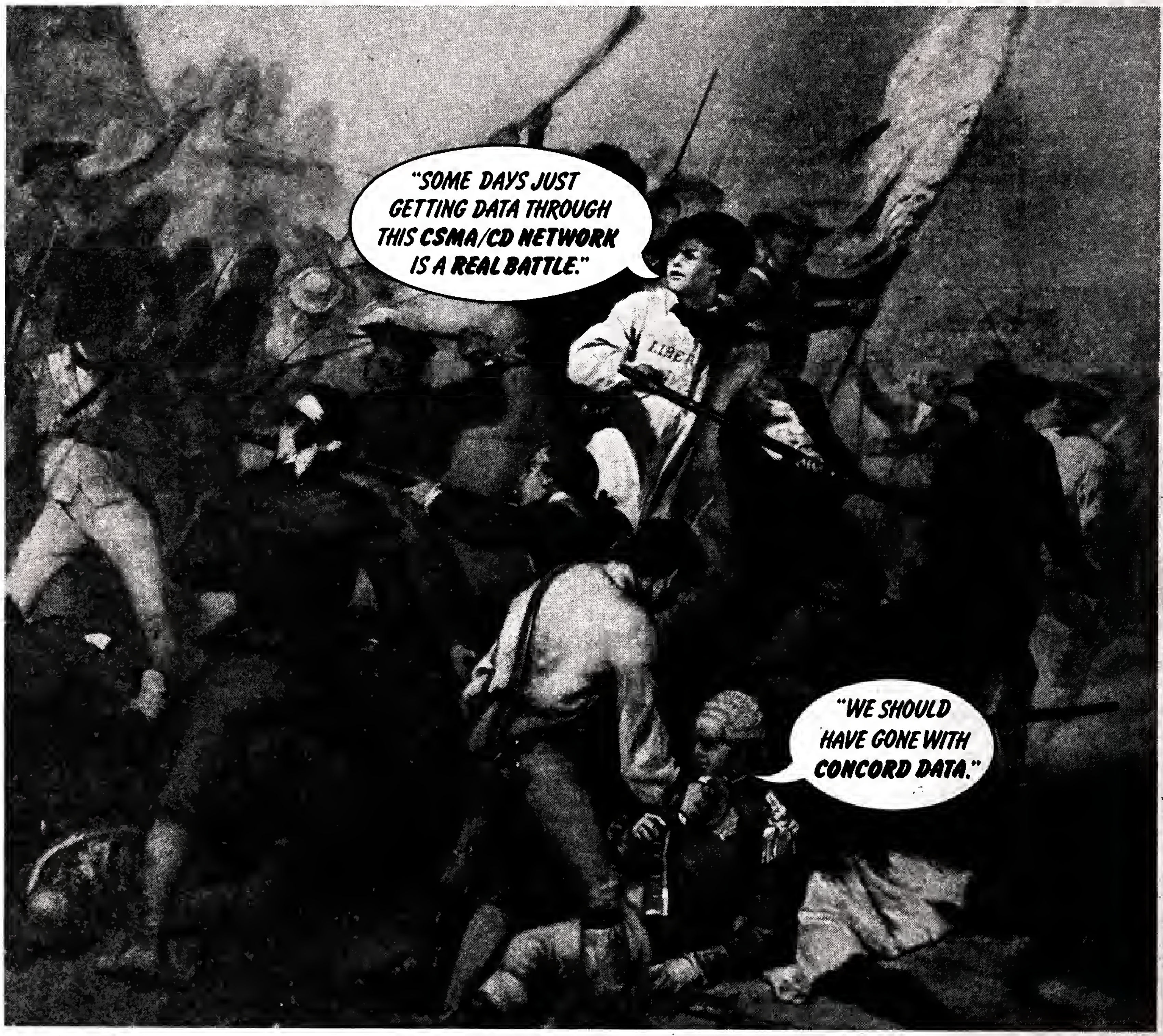
Prices for complete systems like the IBM Personal Computer start at $2,000. In between the two systems lies a black hole — and the bulk of the home market.

Without my prompting, at least four fellow employees told me they were also interested in purchasing a home computer and would spend about $1,500. They chose to wait until prices fall; I was the only one desperate enough to purchase a Kaypro.

There seems to be no logical reason why one can't find a complete system for $1,500. For $700, Coleco Industries, Inc. put together an almost complete system. Why can't another company put together a complete system for twice the price?

As I traveled to various stores the answer became clear. It lies in distribution channels: Retailers do not want to sell systems that cost less than $2,000, and manufacturers do not want to sell computers through mass merchandisers. Unless this problem is solved, home computer sales will remain sluggish.

"Sorry, we can't give you any money — our computer is down."


"SOME DAYS JUST GETTING DATA THROUGH THIS CSMA/CD NETWORK IS A REAL BATTLE."
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Alonzo Chappel. *Battle of Bunker Hill*. Courtesy The Bettmann Archive.

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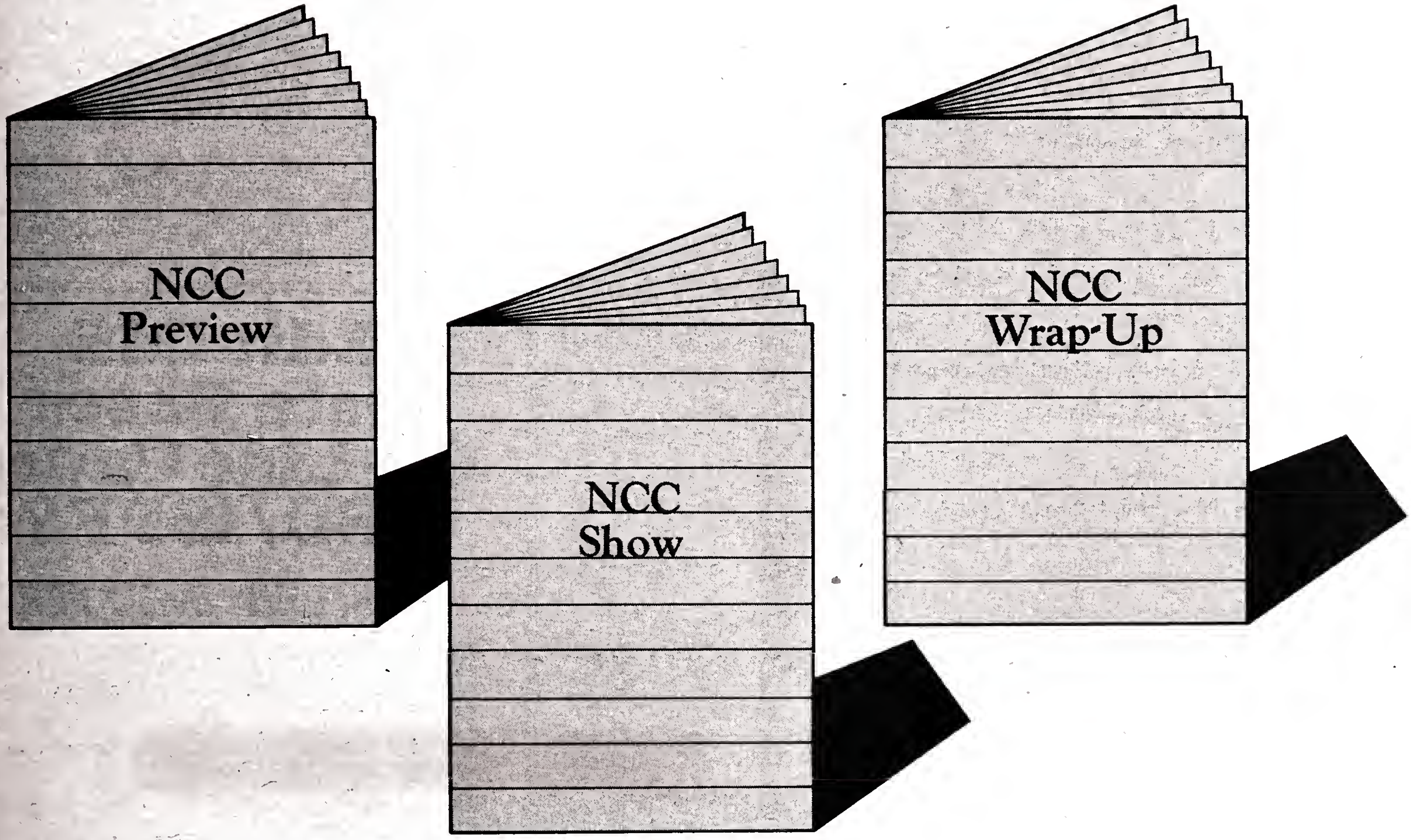

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COMPUTERWORLD

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A PUBLICATION OF CW COMMUNICATIONS

EXECUTIVE CORNER

Pansophic Systems, Inc. has announced the following appointments: **David J. Eskra**, vice-chairman of the board of directors and chief executive officer, and **William G. Nelson IV**, president and chief operating officer.

■

Apple Computer, Inc. has announced the appointment of **David J. Barram** as vice-president and chief financial officer. In addition, Apple has announced that **Joseph P. Nevin** will join the company as the director of MIS.

■

C. **Donald McCullough Jr.** has joined Hogan Systems, Inc. as vice-president in charge of the company's new product management group.

■

Syntrex, Inc. has announced that **Alex Zakson** has joined Syntrex as vice-president of development. Prior to joining Syntrex, Zakson was vice-president of software development and MIS of the interactive products division at Harris Corp.

■

John H. Stearns has joined Data Card Corp. as vice-president of corporate technology and development.

Precision Methods, Inc. has announced the following promotions: **John D. Cooper**, president, and **Wendell Sinclair**, vice-chairman of the board of directors.

■

Anacomp, Inc. has announced that **Louis P. Ferrero** has been appointed chairman and chief executive officer, and **J. Mark Woods** has been appointed to the position of executive vice-president.

■

James V. Napier, president and chief executive officer of Continental Telecom, Inc., has announced he has accepted a job with HBO & Co. to become president and chief executive officer.

■

Arthur R. Braun has been appointed vice-president, engineering, of General Datacomm, Inc.

■

Tandem Computers, Inc. has announced the following appointments: **Thomas Lyman Chun** to the newly created post of vice-president of corporate projects and **Thomas J. Klitgaard** to vice-president, general counsel and corporate secretary.

■

William H. Munson has been named vice-president of software operations at Datamedia Corp.

■

H. H. Simeroth has been named vice-president, engineering, at MSI Data Corp.

See **EXECS** page 75

DEC exec joins Lisp

LOS ANGELES — Ward D. MacKenzie, former group vice-president of the OEM and business computer groups at Digital Equipment Corp., recently resigned to accept the post of chairman of the board and chief executive officer of Lisp Machines, Inc.

Lisp Machines founder F. Stephen Wyle, formerly chairman and chief executive officer of the company, was named vice-chairman. The appointment of MacKenzie to the position of chairman of the board and chief executive officer, Wyle said, "will allow me to concentrate on long-range business strategies as well as the entrepreneurial opportunities offered by the application of [the company's] technology in specific industry areas."

MacKenzie spent 18 years with DEC and was responsible for DEC's retargeting of its microcomputer products to vertical markets.

Named head of DEC's business computer group was John C. MacKeen, vice-president for OEM operations.

Computer brokerage firms merge

MEMPHIS — Ken Bouldin, president and chief executive officer of Economic Computer Sales, Inc. (Econocom), announced last month the merger of his company with ECS/CRS International, a company headquartered in Belgium.

The new company was named Econocom, the trade name used by Economic Computer Sales for 14 years. ECS/CRS was founded in 1973 by its current chairman, Jean-Louis Bouchard.

The two companies had conducted parallel corporate activities for the past 12 years, Bouldin said, and the merger possibilities had been considered for at least that long.

Both companies are engaged in sales and leasing of new and used computer equipment, brokerage of new and used computer equipment and additional services, including financing.

"We're very optimistic about the possibilities accompanying our entry into the global marketplace," Bouldin said. "Our combined strengths will make us a very formidable competitor in the international arena."

Company officials said they expect to have combined sales of $370 million this year and expect employment to grow from 427 employees worldwide to 700 by the end of the year.

GEISCO

from page 61

a strategy that is targeted to specific business thrusts," Williams said in a release detailing the layoff of Geisco personnel.

Last fall Geisco announced a wide array of business offerings designed to transform the company from a general-purpose computer processing business into a value-added communications enterprise.

In regard to its latest reorganization plan, Geisco said: "Specific application businesses that we will more aggressively target include office communications, automated clearinghouse services, supplier and dealer systems, international trade and a portfolio of electronic data interchange markets."

Damian Rinaldi, an analyst with International Data Corp. located in Framingham, Mass., said Geisco's moves are "consistent with the industry's efforts to restructure in the face of a stagnant market."

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EXECS

from page 74

Norm Jones and **Ed Kaczorowski** have joined Lam Research Corp. Jones, formerly of Intel Corp., will fill the newly created post of senior vice-president of process technology and marketing. Kaczorowski, formerly of Zylin Corp., will be director of electrical engineering.

■

Storage Technology Corp. has announced the following appointments: **Robert G. Costain** to the newly created post of corporate vice-president of strategic planning and **Carl R. Vertuca Jr.** to corporate treasurer.

■

Thomas M. Coccione has been appointed president and chief executive officer of Applied Computer Sciences, Inc. Prior to joining Applied Computer Sciences, Coccione worked for IBM and Management Science America, Inc.

■

Southern New England Telephone Co. announced the appointment of **Walter H. Monteith Jr.** to the position of chairman, president and chief executive officer, effective July 1. **Alfred W. VanSinderen**, current chairman, will retire from the company but will remain a director.

■

Data Group Corp. has appointed **Alan F. Atkinson** to the position of president and chief executive officer. Most recently Atkinson was vice-president of the small-computer marketing operations at Honeywell Information Systems. Prior to that he spent 16 years at IBM in a variety of management positions.

■

Image Peripherals, Inc. has announced the appointment of **Louis G. Orsatti** as president and chief executive officer. Most recently Orsatti has served as vice-president and general manager of the data terminal systems division of Datachecker/DTS, a wholly owned subsidiary of National Semiconductor Corp. He has also held positions at Mohawk Data Sciences Corp. and Univac, a division of Sperry Corp.

■

Edmund B. Fitzgerald has been named chairman of the board of Northern Telecom Ltd., succeeding **Walter F. Light** who is retiring after more than a decade at Northern Telecom. Fitzgerald will retain his current responsibilities as chief executive officer and president.

■

Raymond A. Gates has resigned as president and chief executive officer of Panasonic Co., a division of Matsushita Electric Corp. of America (Meca). Gates will continue to serve Meca as senior advisor. **Kiyoshi Seki**, president and chief executive officer of Meca will concurrently assume the position of president of Panasonic.

■

AVL has announced the appointment of **Raymond V. Sozzi** as president and chief executive officer.

■

Aardvark Systems and Programming, Inc. has announced the appointment of **Howard Karvel** as president. He succeeds **Thomas E. O'Donohue**, who becomes chairman.

APPLE

from page 61

troduced in October, the device has been delayed, if not killed.

Granted, the XL was simply a renamed Lisa filling an understudy role until a new star, still apparently in the wings, could step in. Likewise, Apple planned right from the start that third-party vendors would be developing their own versions of file servers for the Macintosh Office.

But in this business, unfortunately perhaps, symbols play a large role, and the scheduled retirement of the XL and apparent scrapping of the Apple file server have removed two key symbols from the Macintosh Office lineup.

Some other symbols to consider are the following: The Macintosh Office failed to make an appearance at OAC '85 earlier this year; and Apple said it will not attend the National Computer Conference this summer. The company, while dependent on dealer sales, didn't even make it to Comdex/Spring '85, the jewel in the crown of the dealer empire, although the company traditionally skips the spring confab in favor of the fall one.

Must contain expenses

In light of the company's recent projections that third-quarter profits will fall below the $10 million posted in the second quarter, it is obvious Apple must contain expenses. In retrospect, expensive ventures into Super Bowl advertising and single-advertiser issues of *Newsweek* were obviously too extravagant, although the decisions were made when projections for micro sales were still in the stratosphere.

Cost cutting is one thing — and all too often companies fail to make the hard decisions until it is too late — but Apple seems to be pulling the legs from under its campaign for the future: namely, becoming a large force in small- to medium-size companies and establishing a viable presence in the Fortune 1,000.

The company also recently indicated it is practically abandoning its direct national sales force. Although that sales force of some 60 people was abysmally small, it was yet another symbol of Apple's willingness to play in the big leagues.

By reigning in advertising, marketing and production, it can hunker down in its relatively debt-free harbor. But the trade-off is that it loses momentum. As Apple's sloop anchors to wait out the storm, the IBM battleship races ahead of the winds.

Each day that Apple hesitates, it falls behind the pace that IBM is setting with its impressive array of micro products.

Perhaps it is time for Apple and the rest of us to concede that, as unappealing as it may be, America's big business is wedded to Big Blue for better or worse. IBM effectively controls computing at that level through its unyielding dominance of data processing.

Whether or not Apple is willing to change its strategy yet again, the company must come to some decision about where it wants to go. On-again, off-again campaigns are the hallmarks of losers.

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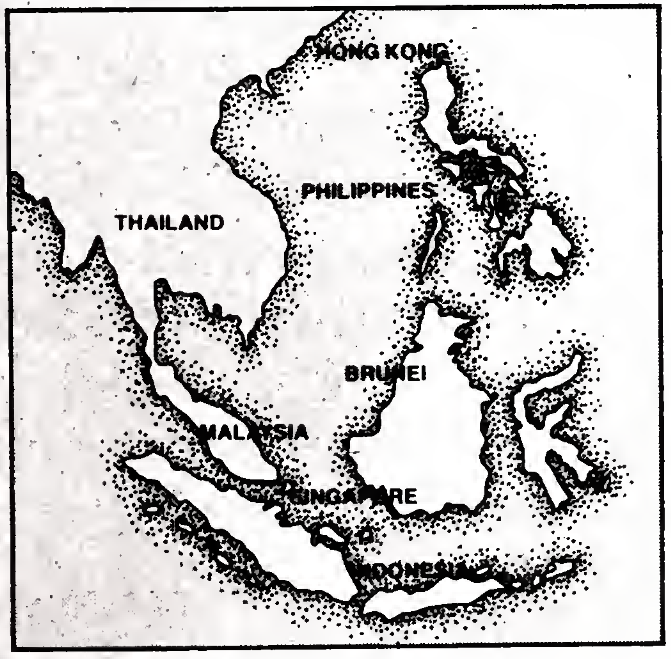

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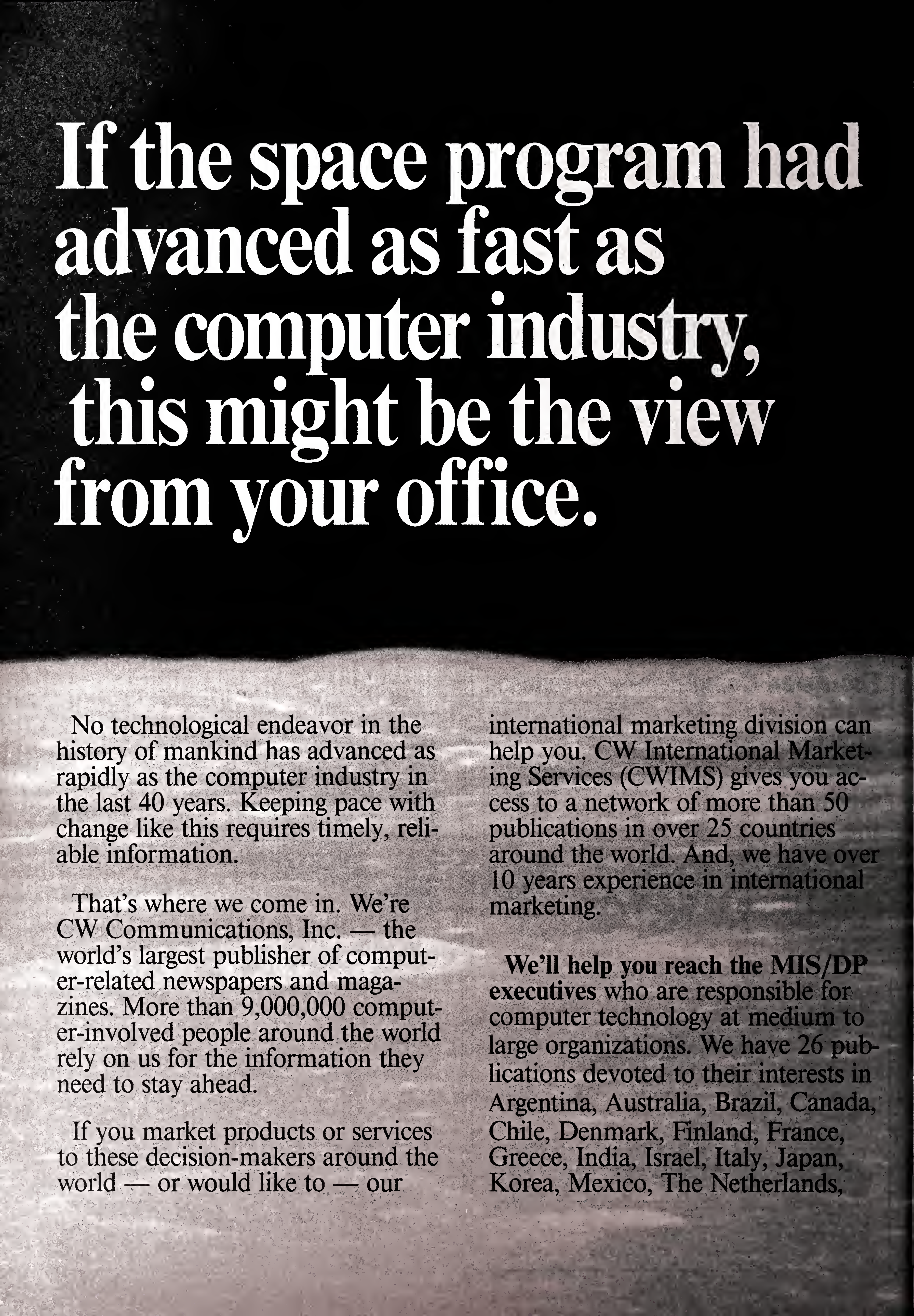

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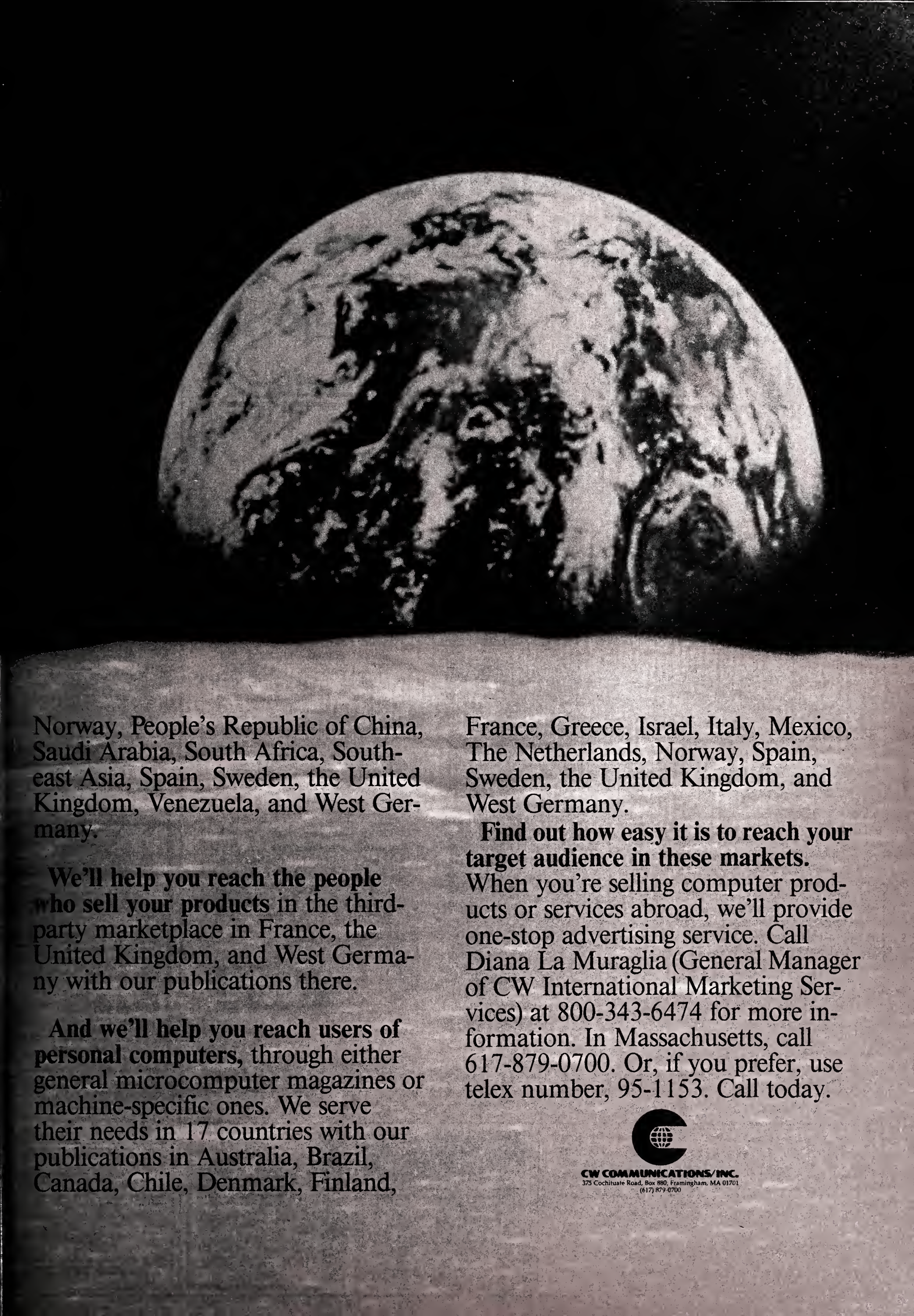

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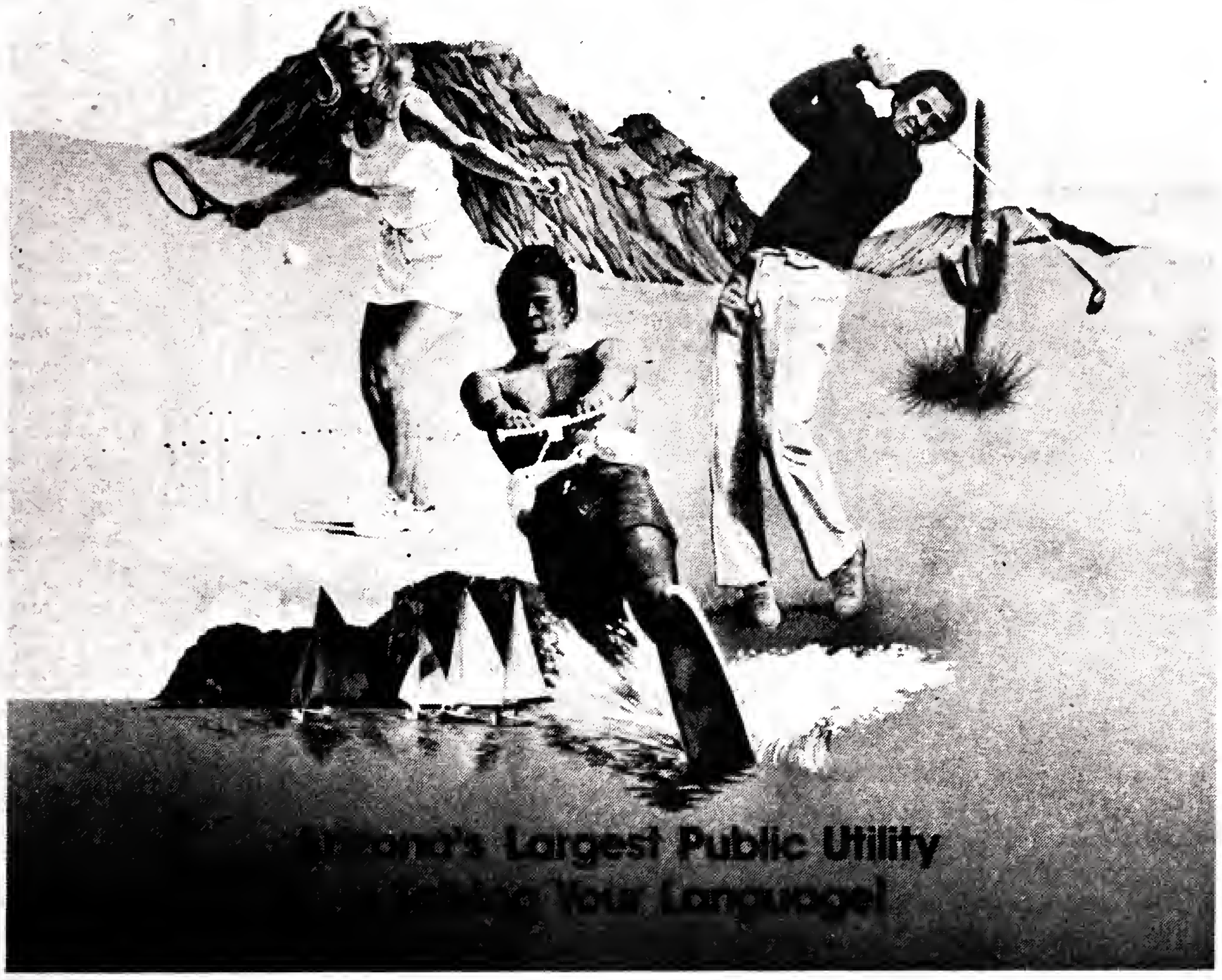

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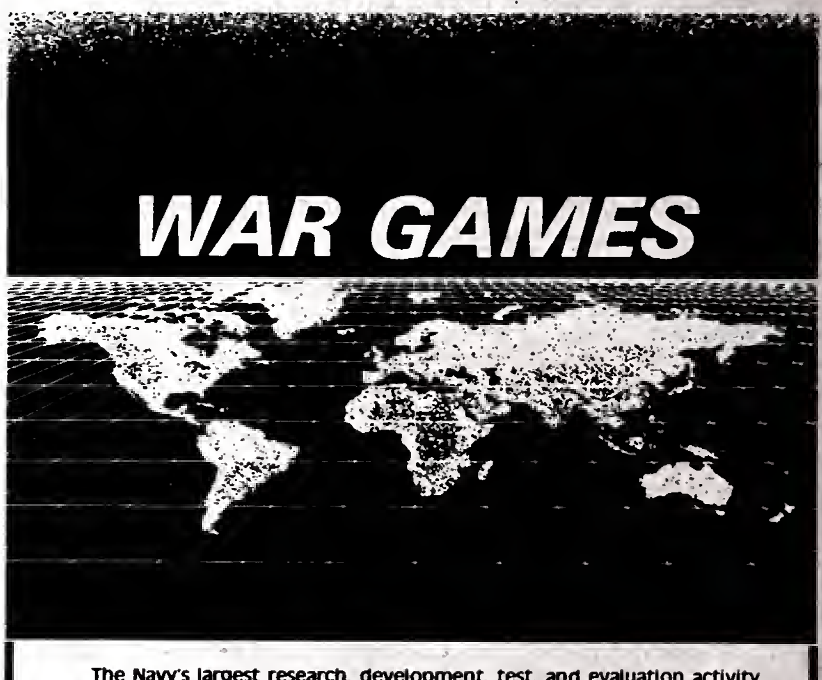

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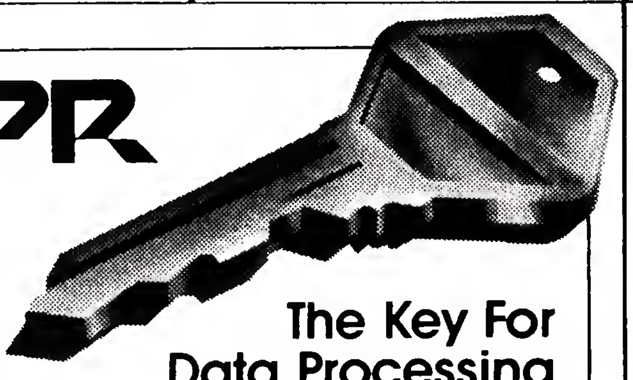

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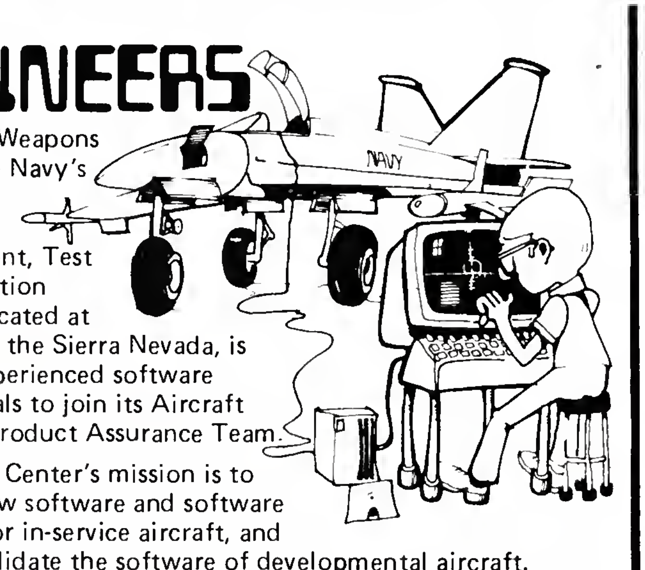

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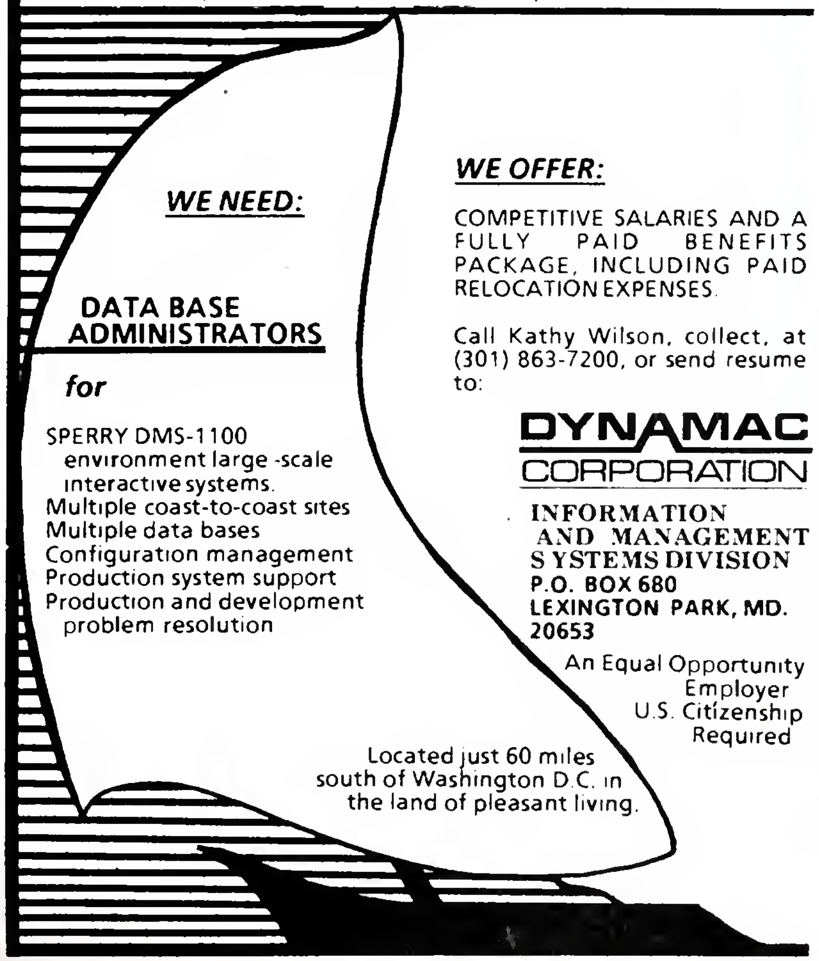

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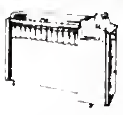

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Request for Proposal No. 1019, due Friday, June 14, 1985, 3:30 p.m. for the acquisition of a JES2 display facility package for the MISSISSIPPI STATE COMPUTER CENTER.

Request for Proposal No. 1020, due Friday, June 14, 1985, 3:30 p.m. for the acquisition of a protocol converter to allow for the connection of up to 64 ASCII devices to an AMDAHL 470/V8 CPU for the Office of Computing and Information Systems of the UNIVERSITY OF MISSISSIPPI.

Request for Proposal No. 1021, due Friday, June 14, 1985, 3:30 p.m. for the acquisition of a disk subsystem upgrade for a Wang VS-100 minicomputer system for the STATE BOARD OF WEALTH.

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A number of special issues of **COMPUTERWORLD** are scheduled to run in 1985. Each of these issues will feature one aspect of the computer industry and give our advertisers a chance to reach a more select audience. These are some of the topics the issues will cover:

- June 24 - **DBMS**
- July 8 - **NCC Preview**
- July 15 - **NCC Show** (early close July 3rd)
- July 22 - **NCC Wrap-Up**
- August 26 - **Software Productivity Packages**
- September 30 - **Minis & Small Business Systems**
- October 28 - **Data Communications Terminals**
- November 25 - **Protecting The Corporate Information Resource**
- December 30, 1985 & January 6, 1986 - **Forecast '86**

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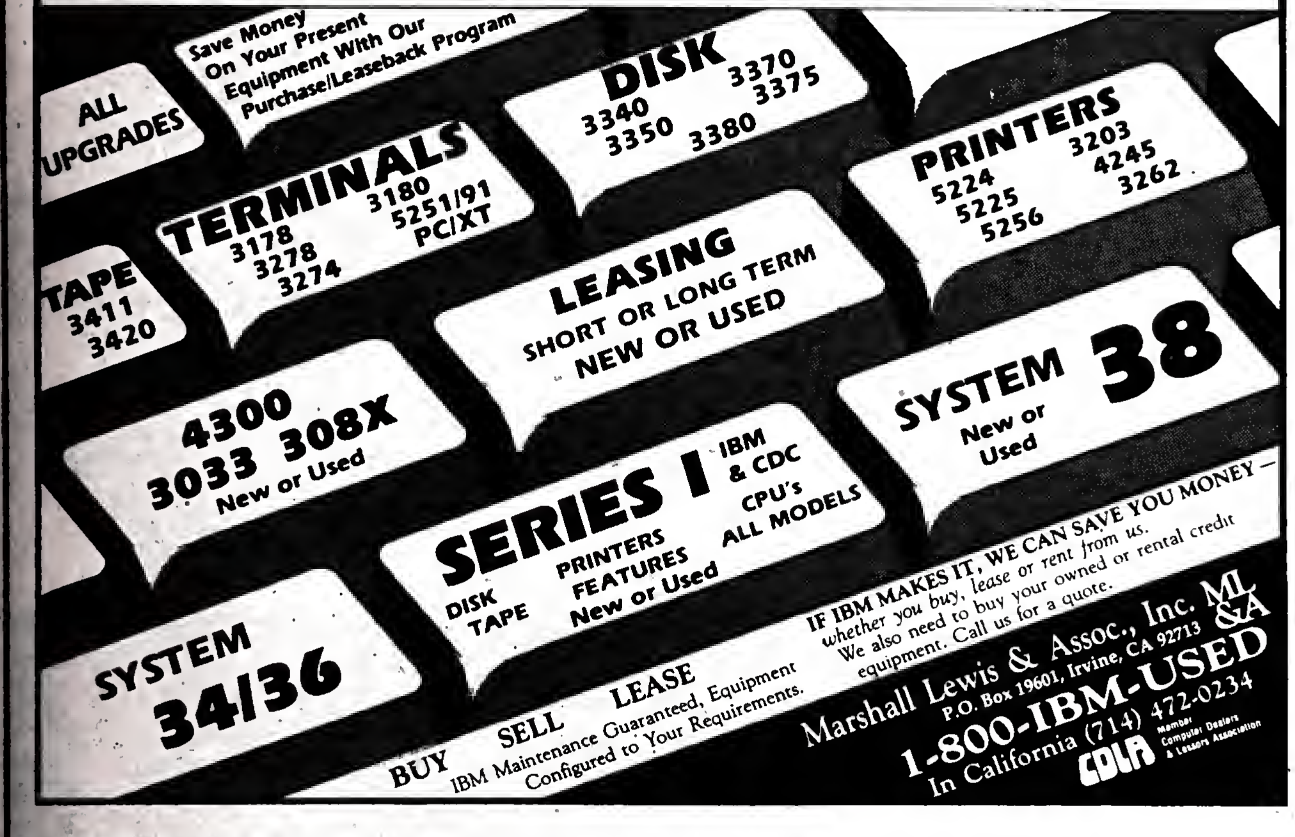

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4331-2	0.50	1 to 4	3083X	4.4	8 to 32
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4341-10	0.75	2 to 4	3083BX	6.6	8 to 32
4341-1	0.88	2 to 4	3083J	8.4	8 to 32
4341-11	1.1	2 to 8	3033MP	8.5	8 to 32
4361-4	1.15	2 to 12	3033AP	8.5	4 to 24
3031	1.2	2 to 8	3083JX	8.8	8 to 32
4361-5	1.45	2 to 12	3081D	10.0	16 to 32
4341-2	1.5	2 to 16	3081G	11.0	16 to 48
4341-12	1.65	2 to 16	3081GX	11.9	16 to 64
3031AP	2.0	2 to 8	3081K	14.0	16 to 48
4381-1	2.1	4 to 16	3081KX	15.5	16 to 64
3032	2.5	2 to 8	3084G	26.6	32 to 96
4381-2	2.7	4 to 32	3084QX	28.7	32 to 128
3033S	2.9	4 to 16	•3090-200	29.4	64 to 192
•3083CX	3.3	8 to 32	†3090-400	52.9	28 to 384

• First Installation 1985 †First installation 1987

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AS 9070	16.2	16 to 64
AS 9080	20	16 to 64
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†AS XL-80	50	64 to 256

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The above information is intended as a guideline for computer users on relative computer system instruction cycle times. All data have been derived from published documentation and represent reasonable estimates of average MIPS ratings. However, Randolph is not responsible for the accuracy of the MIPS data. Cycle times will vary based on hardware/software configurations, and system manufacturers continually modify computer models as design improvements in hardware and software arise.

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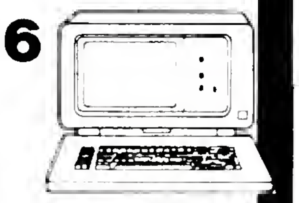

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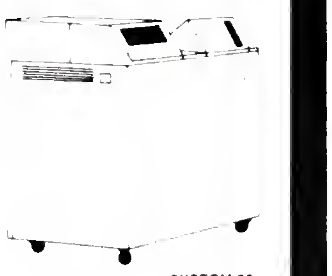

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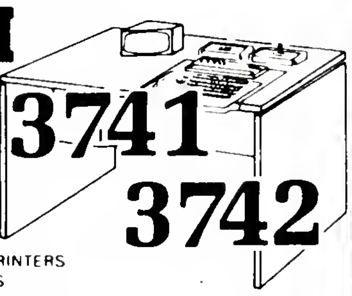

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Be advised that a pre-proposal Vendors' Conference will be conducted on June 14, 1985 at 1:00 p.m. at the New Mexico Educational Assistance Foundation, 3900 Osuna Road, N.E., Albuquerque, New Mexico 87125, to respond to any questions which potential vendors may have concerning the Request for Proposals.

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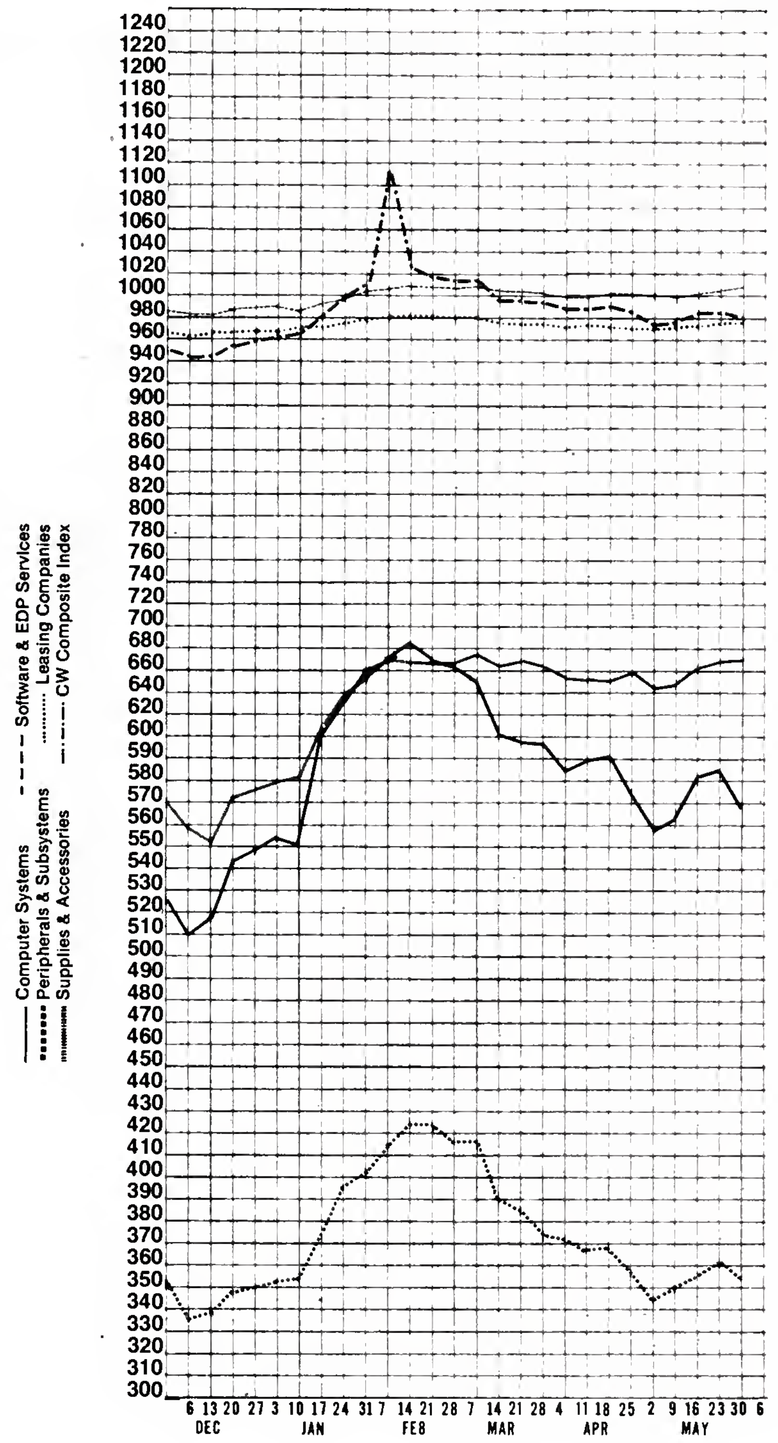

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CLOSING PRICES WEDNESDAY, MAY 29, 1985

COMPUTER SYSTEMS

EXCH		PRICE 1985 RANGE (1)	CLOSE MAY 29 1985	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	5- 24	6	- 1/4	-4.0
O	ALTOS COMPUTER SYST	7- 21	11 1/8	- 1/2	-4.3
A	AMDAHL CORP	10- 19	13 5/8	- 1/2	-3.5
O	APPLE COMPUTER INC	17- 63	17 1/8	-3 1/2	-18.8
N	AT&T	15- 24	23 1/4	- 3/8	-1.5
N	BURROUGHS CORP	48- 66	63 1/4	-2 3/8	-3.8
O	COMPAQ COMPUTER CP	4- 15	8 3/4	- 3/8	-4.1
O	COMPUTER AUTOMATION	3- 17	6 5/8	+ 1/8	+1.9
A	COMPUTER CONSOLES	7- 20	7 3/8	+ 1/8	+1.7
N	CONTROL DATA CORP	25- 39	31 1/8	+ 5/8	+2.0
O	CONVERGENT TECHNOL	5- 41	6 5/8	- 1/2	-7.0
N	CRAY RESEARCH INC	39- 82	82	+1 5/8	+2.0
O	DAISY SYSTEMS CORP	14- 36	24 1/4	-2 1/4	-8.4
N	DATA GENERAL CORP	37- 74	39 1/4	-2 1/4	-5.4
N	DATAPOINT CORP	12- 26	12 1/8	- 1/2	-3.9
N	DIGITAL EQUIPMENT	77-125	105 1/2	- 7/8	-0.8
A	EECO INC	12- 16	14 3/8	- 1/2	-3.3
N	ELECTRONIC ASSOC.	3- 7	5	- 1/4	-4.7
N	FLOATING POINT SYST.	13- 31	27 5/8	0	0.0
N	FOXBORO	26- 38	28	- 1/8	-0.4
N	GOULD INC	20- 32	22 3/4	+ 7/8	+4.0
N	HARRIS CORP	23- 35	26 7/8	- 1/2	-1.8
N	HEWLETT-PACKARD CO	31- 44	33 5/8	+ 3/8	+1.1
N	HONEYWELL INC	46- 69	61 1/8	0	0.0
N	IBM	98-137	129 3/4	-2 5/8	-1.9
O	IPL SYSTEMS INC	1- 14	2	- 1/8	-5.8
N	ITT CORP	21- 42	32 1/2	-1 1/4	-3.7
N	M/A-COM INC	13- 24	20	- 3/4	-3.6
N	MANAGEMENT ASSIST	2- 29	2 1/8	- 1/4	-10.5
N	MATSUSHITA ELEC(ADR)	52- 81	57 1/2	-1 3/4	-2.9
N	MODULAR COMPUTER SYS	8- 10	7	0	0.0
N	MOHAWK DATA SCI	3- 17	2 7/8	+ 1/8	+4.5
N	MOTOROLA INC	28- 44	32 7/8	- 5/8	-1.8
N	NAT'L SEMICONDUCTOR	10- 17	10 3/4	- 1/8	-1.1
N	NBI INC	13- 24	16 1/2	- 3/4	-4.3
N	NCR	21- 31	29 5/8	+ 1/4	+0.8
N	PERKIN-ELMER	18- 30	24 7/8	- 5/8	-2.4
N	PRIME COMPUTER INC	11- 20	17 7/8	- 1/4	-1.3
N	SPERRY CORP	35- 54	53 7/8	+ 7/8	+1.8
O	STRATUS COMPUTER INC	8- 17	14 1/4	- 1/2	-3.3
O	TANDEM COMPUTERS INC	15- 40	18 7/8	-2 3/4	-12.1
N	TANDY CORP	24- 37	32 1/2	- 1/4	-0.7
O	TELEVIDEO SYSTEMS	3- 41	2 5/8	0	0.0
O	TELXON CORP	8- 21	21 1/4	+ 3/4	+3.8
N	TEXAS INSTRUMENTS	88-150	87 1/2	-5 1/2	-5.9
A	ULTIMATE CORP	10- 24	12 5/8	- 3/4	-5.6
O	VECTOR GRAPHICS INC	0- 8	1/2	- 1/16	-11.1
A	WANG LABS "B"	17- 32	17	-1 5/8	-8.7
A	WANG LABS "C"	17- 32	17 1/4	-1 1/4	-6.7
N	XEROX CORP	35- 50	49 1/4	- 1/4	-0.5

LEASING COMPANIES

EXCH		PRICE 1985 RANGE (1)	CLOSE MAY 29 1985	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	10- 22	18 1/4	- 1/4	-1.3
A	CMI CORP	4- 10	9 1/4	+ 1/8	+1.3
N	COMDISCO INC	8- 17	14 7/8	- 1/2	-3.2
O	CONTINENTAL INFO SYS	5- 18	8 3/8	+1	+11.9
N	DPF INC	10- 19	18 3/4	+1 1/8	+6.3
O	FINALCO GROUP INC	4- 12	4 1/2	- 1/8	-2.7
O	PHOENIX AMERICAN INC	2- 17	2 5/8	- 1/4	-8.8
O	SELECTERM INC	8- 21	9 3/4	0	0.0
N	U.S. LEASING	28- 44	35 1/2	- 7/8	-2.4

COMPONENTS

EXCH		PRICE 1985 RANGE (1)	CLOSE MAY 29 1985	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCED MICRO DEV	25- 41	27 3/4	-1	-3.4
O	ADV'D SEMICONDUCTOR	11- 38	12	-1 3/4	-12.7
N	ANALOG DEVICES INC	18- 25	21 1/4	- 1/2	-2.2
O	ANALOGIC CORP	10- 31	14	0	0.0
N	APPLIED MAGNETICS CP	9- 21	14 1/8	+ 1/4	+1.8
O	HADCO CORP	4- 12	4 3/8	+ 1/8	+2.8
O	MICRO MASK INC	7- 18	7 1/2	0	0.0
N	TERADYNE	20- 35	23 1/8	-1 1/8	-4.6

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SOFTWARE & EDP SERVICES

EXCH		PRICE 1985 RANGE (1)	CLOSE MAY 29 1985	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	2- 8	4	+1	+33.3
N	ADVANCED SYSTEMS INC	9- 22	10 1/2	- 1/8	-1.1
O	AGS COMPUTERS INC	10- 32	13	-1 1/4	-8.7
O	AMERICAN SOFTWARE	8- 20	12 1/2	+ 1/4	+2.0
N	ANACOMP INC	1- 5	3 5/8	0	0.0
O	ANALYSTS INTL CORP	5- 17	9 3/4	- 1/4	-2.5
A	APPLIED DATA RES	18- 38	36 1/4	- 3/4	-2.0
O	ASHTON TATE	6- 15	9 1/2	+ 1/2	+5.5
O	ASK COMPUTER SYSTEMS	13- 24	15 1/4	- 1/4	-1.6
B	ASTRADYNE COMP IND	1- 7	2 5/8	0	0.0
N	AUTOMATIC DATA PROC	30- 47	46	- 1/2	-1.0
O	COMPUTER ASSOC INT'L	15- 35	26 3/4	0	0.0
O	COMPUTER HORIZONS	8- 20	9 1/4	+ 1/4	+2.7
O	COMPUTER NETWORK	5- 11	7 3/8	+ 3/8	+5.3
N	COMPUTER SCIENCES	11- 17	15 1/2	+ 3/8	+2.4
O	COMPUTER TASK GROUP	8- 16	16 1/4	+ 5/8	-4.0
O	COMPUTER USAGE	1- 18	3/4	0	0.0
O	COMPUTONE SYSTEMS	4- 23	6 5/8	- 1/4	-3.6
O	COMSERV CORP	1- 16	3 7/8	0	0.0
O	COMSHARE	6- 14	9 1/8	+ 1/4	+2.8
N	CULLINET SOFTWARE	12- 33	28 1/8	-4 1/4	-13.9
O	CYCARE SYSTEMS INC	16- 27	24	0	0.0
O	HOGAN SYSTEM INC	5- 27	4 1/2	- 1/2	-10.0
N	GENERAL ELECTRIC CO	48- 65	60 1/2	- 7/8	-1.4
N	GENL MOTORS E (EDS)	33- 79	79	+2 1/2	+3.2
N	GTE CORP	36- 45	42 1/4	+ 5/8	+1.5
N	INFORMATICS GENERAL	14- 27	25	- 3/8	-1.4
O	INFORMATION SCIENCE	2- 17	2 3/4	+ 3/4	+37.5
O	INFOTRON SYSTEMS CP	15- 43	21 1/4	0	0.0
O	KEANE ASSOCIATES	6- 19	16 1/2	-1 1/2	-8.3
A	LOGICON	18- 34	30 3/8	-1 1/2	-4.7
O	LOTUS DEVELOPMENT CP	15- 40	30	- 3/4	-2.4
O	MCI COMMUNICATIONS	6- 28	8 3/8	-1 1/8	-11.8
O	MGMT SCI AMER INC	9- 33	14 3/8	+ 5/8	+4.5
O	MATHEMATICAL APP GRP	6- 18	5 1/2	0	0.0
O	MICOM SYSTEMS INC	17- 50	17 1/4	-3 1/4	-15.8
O	MICROPRO INT'L CP	2- 10	2 3/4	+ 3/8	+15.7
O	NATIONAL DATA CORP	8- 26	11 3/4	- 1/8	-1.0
O	ON-LINE SOFTWARE INT	4- 29	7	+ 1/2	+7.6
O	PANSOPHIC SYSTEMS	11- 30	20 7/8	- 1/2	-2.3
N	PLANNING RESEARCH	10- 15	12 1/2	+ 1/2	+4.1
O	POLICY MGMT SYSTS CP	22- 35	24 3/4	- 3/4	-2.8
O	PROGRAMMING & SYS	4- 8	5 1/4	+ 1/8	+2.4
O	REYNOLDS & REYNOLD	28- 53	39 1/4	+ 1/4	+0.6
O	SEI CORP	11- 34	16 1/4	+ 1/4	+1.5
O	SHARED MEDICAL SYST	23- 43	30	+ 1/4	+0.8
O	SCIENTIFIC COMPUTERS	5- 14	6 1/4	- 1/8	-1.9
O	SOFTWARE AG	9- 21	15	+ 3/8	+2.5
N	URS CORP	10- 14	10 3/8	- 1/8	-1.1
N	UCCEL	7- 17	14	0	0.0

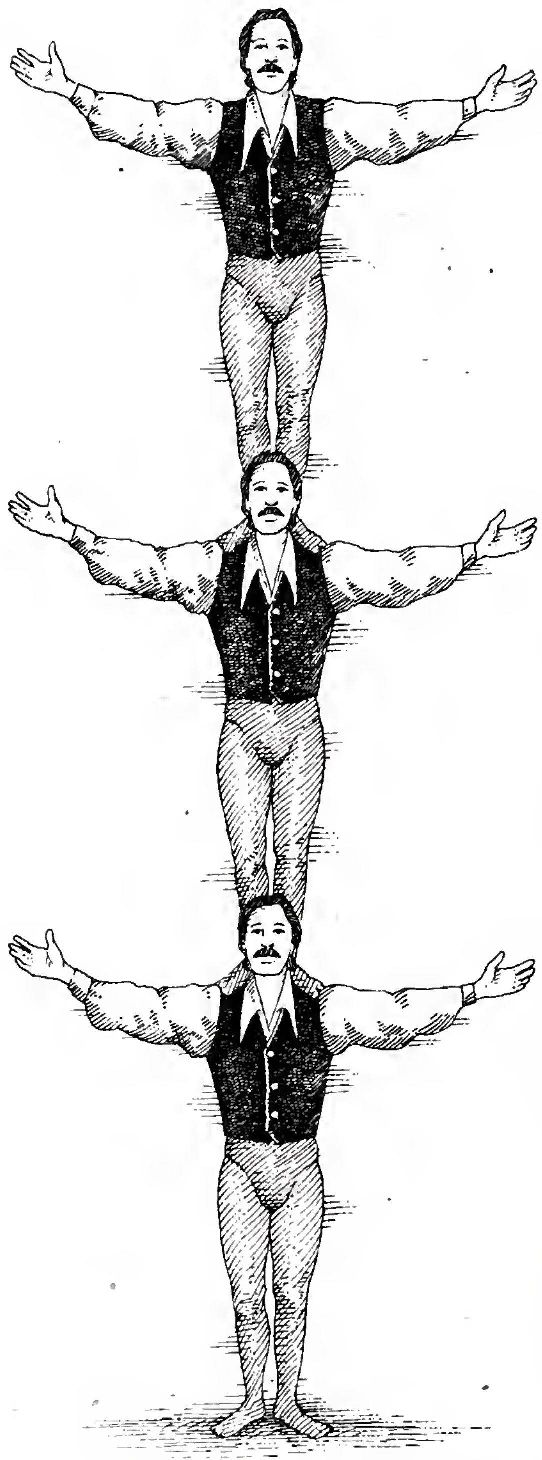
PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1985 RANGE (1)	CLOSE MAY 29 1985	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	2- 7	4	- 1/8	-3.0
A	ANDERSON JACOBSON	3- 11	4 1/8	- 1/4	-5.7
O	AST RESEARCH INC	7- 20	17	- 1/8	-0.7
O	AUTO-TROL TECHNOLOGY	7- 28	9 1/8	0	0.0
O	AVANT-GARDE COMPUTNG	8- 28	9	-1 1/4	-12.1
O	BANCTEC INC	5- 22	8	0	0.0
A	BEEHIVE INT'L	1- 7	1/2	0	0.0
N	BOLT,BERANEK & NEW	17- 30	26 1/4	-2 1/4	-7.8
O	CAMBEX CORP	1- 3	1 3/4	- 1/8	-6.8
N	CENTRONICS DATA COMP	3- 14	3	- 5/8	-17.2
A	CETEC CORP	7- 12	8 1/2	0	0.0
A	COGNITRONICS	4- 8	8 1/8	+ 3/8	+8.5
N	COMPUGRAPHIC CORP	26- 37	27	0	0.0
O	COMPUTER TRANSCEIVER	1- 10	7/8	0	0.0
N	COMPUTERVISION CORP	14- 46	14 1/4	-1 3/4	-10.9
N	CONRAC CORP	11- 17	13 1/2	- 1/8	-0.9
A	DATAPRODUCTS CORP	12- 26	11 1/2	- 5/8	-5.1
A	DATARAM CORP	4- 12	4 1/2	- 1/4	-5.2
O	DATA SWITCH CORP	4- 41	5	0	0.0
O	DATUM INC	5- 17	6	- 1/4	-4.0
O	DECISION DATA COMPUT	9- 19	13 1/8	- 1/2	-3.6
O	DOCUTEL-OLIVETTI	3- 39	5 1/4	0	0.0
N	ELECTRONIC M & M	5- 9	8 1/2	+ 1/4	+3.0
O	ENDATA, INC	4- 16	4	+ 1/2	+14.2
O	EVANS & SUTHERLAND	11- 50	14 7/8	- 3/4	-4.7
O	GANDALF TECHNOLOGIES	6- 14	6 5/8	- 3/4	-10.1
N	GEN'L DATA COMM IND	13- 20	15 1/8	- 1/8	-0.8
N	HAZELTINE CORP	23- 33	26 1/8	+ 3/4	+2.9
O	ICOT CORP	3- 8	5 7/8	0	0.0
O	INFORMATION INTL INC	10- 18	13	- 1/4	-1.8
O	INTECOM INC	5- 21	5 1/4	- 1/8	-2.3
O	INTEL CORP	25- 45	27	- 3/4	-2.7
A	LUNDY ELECTRONICS	7- 14	13 7/8	+ 1/8	+0.8
O	MEGADATA CORP	3- 8	5 1/2	- 1/8	-2.2
A	MSI DATA CORP	8- 18	8 1/8	+ 1/8	+1.5
N	NASHUA CORP	19- 29	27 1/4	+ 1/8	+0.4
O	NETWORK SYSTEMS CORP	16- 34	23 3/4	- 7/8	-3.5
N	NO AMERICAN PHILIPS	30- 45	40 3/4	- 3/4	-1.8
N	NORTHERN TELECOM LTD	30- 42	37 3/8	- 3/8	-0.9
O	OMEX	1- 6	1/8	0	0.0
N	PARADYNE CORP	11- 18	11 1/2	- 1/2	-4.1
A	PENRIL CORP	9- 14	12 1/8	0	0.0
N	PLESSEY CO (ADR)	20- 35	20 1/2	- 3/4	-3.5
O	PRINTRONIX INC	11- 34	11 1/4	- 1/4	-2.1
O	QMS INC	8- 17	10 1/4	- 1/4	-2.3
O	RAMTEK CORP	4- 23	4 1/4	- 1/4	-5.5
N	RECOGNITION EQUIP	10- 17	9 7/8	+ 1/8	+1.2
N	SANDERS ASSOCIATES	32- 51	35 7/8	+1 1/8	+3.2
O	SCAN-TRON CORP	9- 18	13 1/4	+ 7/8	+7.0
N	SCIENTIFIC ATLANTA	8- 14	11 3/8	0	0.0
O	SEAGATE TECHNOLOGY	4- 20	8 7/8	- 3/8	-5.1
N	STORAGE TECHNOLOGY	2- 12	2 5/8	- 1/8	-4.5
O	SYKES DATATRONICS	1- 13	5/8	- 1/8	-15.3
A	T BAR INC	6- 11	6 1/4	- 1/4	-3.8
A	TAB PRODUCTS CO	13- 20	18	- 1/2	-2.7
O	TANDON CORP	4- 35	4 1/2	- 1/2	-10.0
A	TEC INC	8- 13	12 7/8	+ 1/8	+0.8
N	TEKTRONIX INC	52- 68	57 3/4	- 1/2	-0.8
N	TELEX	18- 47	42	- 7/8	-2.0
O	TESDATA SYSTEMS CP	2- 17	2 1/8	- 1/8	-5.5
N	TIMEPLEX INC	13- 23	19	+ 1/2	+2.7
O	VISUAL TECHNOLOGY	1- 28	1	+ 1/8	+14.2

SUPPLIES & ACCESSORIES

EXCH		PRICE 1985 RANGE (1)	CLOSE MAY 29 1985	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	17- 27	25 3/8	- 1/4	-0.8
N	BARRY WRIGHT	20- 33	20 1/8	-1 7/8	-8.5
A	DUPLEX PRODUCTS INC	22- 34	34	+2 1/4	+7.0
N	ENNIS BUS. FORMS	18- 38	38 1/2	+1	+2.8
N	3M COMPANY	69- 86	78 1/2	-1 1/4	-1.8
N	MOORE CORP LTD	18- 53	19	+ 1/8	+0.6
O	STANDARD REGISTER	27- 58	58 1/4	+2	+3.5
N	WALLACE COMP SERVICE	23- 38	35 3/4	-1	-2.7

OF THE BIG THREE IN BUSINESS SOFTWARE TODAY, WHO'LL BE ON TOP TOMORROW?



If you look at the big three, you see that each of us has a fast growth rate, and each claims to have "total-solution" software. A multiplicity of packages that give you complete mainframe capability, plus a PC link.

But whose total solution is best? If you agree that success is the reward for a job well done, you may agree with the prediction we make at McCormack & Dodge.

The company that's on top tomorrow will be the company that's on top of your business problems today. With the solutions that are easiest to apply—the solutions that promise the fewest future headaches.

When you're talking "total solution," this can mean only one thing. The product line that works best as a totality will be the easiest and most effective for all parties. User and vendor alike.

We believe your own analysis will quickly point out which of the big three has the most integrated family of products. Even though all three claim total integration.

We believe you'll find that two companies offer the mere appearance of integration. An agglomeration of business applications linked superficially, through hinges, patches, shadow files and masks.

While one offers the real thing. Millennium. A true family of business software in which the whole works as smoothly as any part. In which every package has the same query mechanism, the same report writers, the same screen generation, the same on-line documentation, security and real-time capabilities. So that when the packages are put together, there are absolutely no borders between them. They fit like pieces in a jigsaw puzzle. Making the most efficient use of all your data processing resources.

There's even a Millennium application development tool, so you can create new systems as you need them. Without slow, expensive programming.

Of the big three in software today, who'll be on top tomorrow?

Don't stop asking until you know.

McCORMACK & DODGE

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